FOR DISCUSSION

ONTARIO MINISTRY OF SKILLS DEVELOPMENT

DIRECTING SKILLS TRAINING TO MEET THE DEMANDS OF THE SERVICE SECTOR

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Ministry of Skills Development
The Honourable Alvin Curling
Minister

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EXECUTIVE SUMMARY

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The Ministry of Skills Development has identified the rapidly growing service sector of Ontario's economy as one that presents major human resource challenges. As the broad forces of technology diffusion and global competition are manifested in the service sector, employers in service industries are confronted with new training issues and opportunities unique to this sector. In responding to the challenges of service industries, training programs in both the private and public sectors must focus attention and assistance on areas where the needs are greatest and where investment in skills development will provide the most significant economic payoff.

In this report, five service industries are studied: financial services; hospital services; installation, repair and maintenance services for manufacturers; design services; and broadcast and film production services. The selection of these industries was guided by three criteria: industries that exhibited extensive linkages to the manufacturing sector; services which are or could be exported; and those industries which should be classified as relatively knowledge-intensive.

The objectives of the study were:

- To identify and describe the major trends in the demand for skills -- both current and emerging -- in key service industries of Ontario's economy.

- To outline the broad training requirements associated with these trends and the barriers firms face in meeting these requirements.

- To identify opportunities for enhancing training programs so as to most effectively meet the needs of these key service industries.

The paper emphasizes the practical workplace skills necessary to ensure the competitiveness of firms and the industry as a whole. It focusses on the training and re-training needs of existing employees resulting from technological change and competitive trends. It determines how current training needs are being met and where gaps exist. The report presents both the detailed industry findings and the major skills training issues that cut across some or all of the industries.

Brief summaries of the key findings for each of the five industries are presented below. Each summary discusses the industry and its skills requirements, current training activity and training gaps and opportunities that have been identified.

FINANCIAL SERVICES

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The Industry and its Skills Requirements

The financial services industries consist of four pillars -- banks, trust companies, insurance companies, and investment dealers. A major employer, the financial services industries employ 274,000 people in Ontario, 109,000 of whom are employed in the banking and trust company section alone. Growth in financial services has outpaced the economy as a whole, with employment growing by almost 30 percent since 1980.

Clerical staff represent the largest employment group in financial services. For example, within the banking industry this group constitutes 71 percent of total employment, while managerial occupations account for 25 percent, professional staff in mathematical-related sciences 3 percent and sales staff 1 percent. Employment growth and skills requirements in financial services has been highest in those areas dependent on new technology and in financial management.

One of the key trends affecting financial services is deregulation and the growth of inter-pillar competition. Canada's trading partners, notably the United States and the United Kingdom, are deregulating their financial services industries. Ontario legislation opened the securities industry to foreign and non-industry ownership as of June 1, 1987. Banks are now offering discount brokerage services and are acquiring Canadian investment dealers. Trust companies are marketing mutual funds. Some life insurance companies are buying investment dealers. Investment dealers are selling money market instruments and are involved in merchant banking activities such as arranging leveraged buy-outs.

The other major industry trend is technological change. The industry has been a leader in adopting new technology. Projections point to a continuation in this trend, as large banks and trust companies are expected to spend billions over the next five years in computer systems and networks alone. One major life insurance company recently implemented a company-wide computer system to manage its asset-liability matching. Competitive pressures to make sound investment decisions are increasing. Expert systems are being developed to embody the decision-making rules of experienced securities and foreign exchange traders.

Current Training Activity

While each of the financial services industries has adopted similar approaches to training, commitments to this priority differ markedly across industries.

The chartered banks are the training leaders in financial services. In 1984-85 the seven major Canadian banks spent $113 million on training. Banks rely on formal internal training programs in lending and finance, management, sales, operations and customer service to develop proficiency on the job. Generic training is given in time management, career planning and supervisory skills.

Much of the training is provided through the Institute of Canadian Bankers, an industry association which offers courses for bankers in a university setting. The program focuses on business skills and is available to all employees. On-the-job training is also provided to enable employees to perform particular job functions. Banks tend to see training as an integral part of human resources management and to work with employees to involve them in their own skills development.

Trust companies also provide training opportunities for their staff. It is estimated that 20 to 40 percent of staff are engaged annually in formal training programs. The Trust Companies Institute offers technical education programs to employees of member companies in seven different specialities which are a prerequisite for advancement in the industry. Reimbursement, study leave and completion bonuses are available at many trust companies. The industry is building its internal resources for management training.

Insurance companies also have industry associations which provide formal training opportunities for staff. Internal training departments have been receiving more corporate resources in the past few years.

Investment dealers typically do not offer extensive internal training programs for their employees beyond orientation training and selling skills. The Canadian Securities Institute represents the educational arm of the securities industry and also provides training to other members of the financial services industry and private individuals. The Toronto Stock Exchange provides technical and management training programs for its member firms.

Training Gaps And Opportunities

The industry as a whole devotes

considerable resources to training, with each of the pillars demonstrating different commitments to training as a factor in industrial competitiveness. A number of training issues have surfaced in the study. Briefly, these include:

- Technological change is affecting training requirements as it changes the manner in which tasks are undertaken;

- The training of personnel in the use of new computer technology has not kept pace with the large scale purchase of equipment;

- Women are key players in the industry, representing 60 percent of employment; most often women employees are concentrated in clerical and administrative jobs where training is done mainly on the job and the effects of training in the use of new technology are most often felt;

- Delivering training efficiently presents challenges to the industry in general, particularly in organizations which are large and geographically dispersed; use of such avenues as computer-assisted learning, self-learning, and train-the-trainer programs are being implemented;

- Training of part-time employees presents a challenge to those parts of the industry which must expand their operations quickly to take advantage of opportunities.

- Although large companies have a substantial commitment to training, smaller companies may not have the resources, people or dollars to develop training plans and programs;

- Literacy training in areas such as English as a second language, especially for those dealing directly with customers, is a need in some companies;

- Training employees in salesmanship techniques is a training need with all financial service players due to mounting competitive pressures between the various sectors.

PUBLIC HOSPITALS: TECHNICAL AND ADMINISTRATIVE SUPPORT

Public hospitals dominate employment in Ontario's health care sector, accounting for approximately 140,000 employees or close to two-thirds of total industry employment. Employment within the hospital sector can be grouped into three major areas: nursing; diagnostic, therapeutic and emergency; and administration and support. All of these areas have exhibited strong employment gains -- especially in part-time staff, which increased by 41 percent between 1979-80 and 1983-84.

The province's health care system is expected to face escalating cost pressures, which will present a major challenge to effective resource management, including the optimal placement of human resources.

In this study, skills development issues were identified in three areas of public hospitals: i) enhancing management skills; ii) developing information processing capability; and iii) re-evaluating professional requirements in nursing. The training activity, gaps and opportunities in each area are discussed below.

Management Skills

Hospitals face a unique set of challenges in developing effective management skills. The health care professionals holding most management and supervisory positions at hospitals usually do not receive formal training in these areas. University and college programs in health administration graduate 40 to 50 students a year, compared to the 11,000-14,000 managers and supervisors in the hospital system.

Several hospitals are attempting to develop their own internal management training programs, drawing on both their own training resources and outside assistance. Program content varies from hospital to hospital. Some hospitals take advantage of management courses and seminars offered by the Canadian Hospital Association and the Ontario Health Association. Total enrolment in programs offered by the two organizations is about 2,500 annually.

Management training courses provided by individual hospitals and the industry association are undoubtedly making a positive contribution to developing hospital management skills, but their effectiveness is hampered by their uneven application. Because the national and provincial associations provide their courses independently of the other, considerable overlap exists. A more standardized approach could improve efficiency and effectiveness.

Information Processing Skills

Lead by the Ministry of Health, Ontario's hospitals are being called upon to improve the capability of their statistical and financial information systems. Most are well underway in the development of on-line systems. Hospitals have indicated that the training of medical professionals and clerical staff to work with upgraded information systems has not been a major problem. Systems have been designed to be user-friendly and menu-driven. Training has been done in-house with assistance from system vendors.

According to hospital administrators, a key skills issue facing hospitals in the area of information processing is a market shortage of word- and data-processing staff.

Re-evaluation of Nursing Requirements

The two largest employment groups in nursing are nurses and nursing assistants, followed by nursing orderlies, clerks, and others. Ontario's colleges and universities are the major trainers of nurses and nursing assistants. Regular upgrading of nursing skills is essential to keep pace with continuing advances in health care practice and technology and also to train nurses in specialized areas such as operating room, critical care, and neonatal intensive. Larger hospitals tend to handle training needs internally while medium and small hospitals rely on local universities and colleges, with the latter playing a larger role.

Major changes in the foundation training of nurses are being considered which are expected to exert considerable financial and capacity pressures on existing training and educational infrastructure. A proposal put forth by professional associations to raise the educational requirements to practice nursing would, if accepted, contribute significantly to the retraining challenge of nurses. Pressures for upgrading are currently driven by employers who tend to restrict hiring or promotion to nurses with university degrees.

MANUFACTURING SERVICES: INSTALLATION, REPAIR AND MAINTENANCE

The Industry and its Skill Requirements

Installation, repair and maintenance activities in support of manufacturing operations are formally classified under a number of industry sectors. However, because of the distinct and critical role these services play in promoting manufacturing competitiveness, they have been defined as one sector for the purposes of this study.

The occupations involved in this sector are concentrated in the skilled trades and technical areas, including construction-related trades, some industrial trades such as machinist and mechanical millwright, technicians and technologists from a number of disciplines - with electronics being particularly important - and engineering. This study focusses on the skills of technicians and tradespeople, rather than the skills of professional engineers.

Installation, repair and maintenance services are provided to the manufacturing sector from three sources: contractors; machinery and equipment vendors; and in-house personnel. Ontario had close to 10,000 mechanical and electrical contractors in 1984, with equivalent full-time employment of 47,000 people. As a rough estimate, 10 to 25 percent of their work would be repair- and maintenance-related for non-residential clients. Installation cannot be identified separately from new construction or new equipment purchases. As a very rough estimate, about 15 percent of Ontario's total manufacturing employment (including machinery and equipment producers), or 110,000 people, would be involved in in-house repair and maintenance.

Current Training Activity

There are three key training routes for foundation training of installation, repair and maintenance workers: traditional trades apprenticeship programs; manufacturer-based apprenticeship programs; and full-time college training.

Traditional apprenticeship in a given trade with a contractor or employer in that trade typically lasts three to four years with a combination of classroom and on-the-job training. In the year ended March 31, 1987, approximately 1,800 installation, repair and maintenance-related apprenticeships were completed.

Manufacturer-based apprenticeship programs related to repair and maintenance skills are a recent development. These programs provide training specifically geared to a particular employer's requirement. They have been instituted by employers in response to the difficulty in hiring skilled tradesmen for repair and maintenance and because of the perceived opportunity to develop better qualified people for specific requirements. Typically, such programs take three to four years, combining classroom and on-the-job training. The Ministry of Skills Development and Community Industrial Training Committees support such programs.

Ryerson, the colleges of applied arts and technology, and private institutions offer full-time diploma programs ranging from two to four years in disciplines related to installation, repair and maintenance. This training is intended to add a stronger component of theory than is developed through apprenticeship programs. Some employers sponsor their staff in these programs to develop the required skills. Approximately 3,500 people graduate annually from such programs, and

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usually work as technicians or technologists.

Following foundation training, there are a wide variety of other types of training used by employers to both develop and enhance repair and maintenance skills. Manufacturers and contractors often take advantage of training programs offered by machinery and equipment vendors. Some sponsor part-time or night school training opportunities. Others are attempting to develop their own internal electronics updating programs. The Ministry of Skills Development recently introduced a Trades Updating program which offers 30-90 hour courses designed to enable skilled tradespeople to update their skills in response to new technologies and changing market conditions.

Training Gaps and Opportunities

Several training issues related to apprenticeship programs and full-time college training have been identified by employers.

Regarding apprenticeship training, a number of concerns have been expressed regarding the standards for earning and maintaining a certificate of qualification (COQ):

- The system for revising curriculum and setting new standards for testing is not always sufficiently responsive to input from industry and academic experts.
- The absence of a system for testing practical knowledge means qualifications and skills can vary considerably among COQ holders.
- Few mechanisms exist to ensure that journeymen maintain and update their skills.
- The need for interdisciplinary and multi-skills training is not always met by traditional apprenticeship programs.
- Marketing of employer-based apprenticeship is insufficient to promote expansion of the program.

Demand is high for technicians and technologists who graduate from full-time college programs. However, despite skills shortages in a number of areas, notably electronics, the applicant base for technical diploma programs is declining.

More critically, the rapid advances occurring in technology, particularly electronics, make it increasingly difficult for colleges to provide up-to-date training.

This raises a number of issues concerning the most effective approach by colleges to maintaining relevance in technical training. Specialization, for example, is one option which many colleges are pursuing to facilitate investment in expensive state-of-the-art equipment and facilities. Cross-fertilization of teaching staff with technical professionals in industry is another approach which is often highly recommended by industry.

DESIGN INDUSTRIES

Design industries are problem solvers. They must work within constraints of space, cost and physical features to produce creative and functional solutions. They are knowledge-intensive industries combining artistic talent and extensive technical skills.

The four segments of design that were analyzed in this study are graphic, interior, industrial, and fashion. Due to the distinct character of each segment, profiles of the industry, current training systems, and training gaps/opportunities are discussed separately for each design area.

Graphic Design

Graphic design is the largest segment of the design "sector". Nonetheless it is a small industry. Strictly defined as graphic design firms, it employs fewer than 5,000 people. Inclusion of the elusive number of corporate design staff, however, would swell this estimate significantly.

Graphic design is an outgrowth of commercial art. It assists clients in presenting information to customers and the public in a creative and intrusive way within the limitations of the media used. It requires artistic talent and a solid understanding of the technical characteristics of printing processes and materials. In larger firms, specialists perform the two sets of activity, conceptualization and technical support. However, even the creative individuals in larger firms must have a thorough knowledge of technical requirements to perform their function adequately. Impractical concepts are worthless.

Graphic design staff develop foundation skills in special design programs at Ontario's colleges and universities. Once hired, they enhance their skills largely through on-the-job training. Few formal training opportunities exist as most companies are simply too small to afford them and most practitioners believe that real-life experience is the only way to upgrade and sharpen skills.

Industry participants do not see formal upgrading as a priority. Rather, their concern is focussed on the foundation skills of new entrants. Companies sometimes find that new recruits are not sufficiently trained in the practical requirements of the production processes. Some employers are frustrated at what they see as the excessive emphasis on "art for art's sake" at the expense of the practical problem solving skills. Suggestions have been put forward by some industry participants that the province reduce the number of design programs and lengthen and upgrade those that remain.

Interior Design

Estimates place the number of employees of interior design firms at over 3,000. As well, there are many active interior designers in retailing and decorating materials businesses.

Interior designers are responsible for the design and implementation of the complete interior environment. Their work includes corporate offices, retail outlets, restaurants and residences. Salaried designers in firms tend to work with commercial clients while freelancers are residentially oriented. The skill requirements for entry into the profession are demanding. In addition to creative talent, an interior designer must have knowledge of interior construction methods, heating, electrical and building codes, furniture, materials and human factors.

Foundation skills are developed at several Ontario colleges although the three-year program at Humber and the four-year program at Ryerson are the major sources of new hires at commercial design firms. The two-year programs at other colleges are aimed at providing basic design concepts for residential designers and people in affiliated industries who sell through commercial designers.

Upgrading of skills is done largely through on-the-job experiences. Typical interior design projects are undertaken by teams, providing an opportunity for junior people to learn from more senior professionals. Design firms move people through levels as experience is gained and ability demonstrated.

The extent of formal training is being increased since the passage of the Association of Registered Interior Designers Act in 1984. The industry association, ARIDO, is now empowered to grant the Registered Interior Designer designation. As a result, the association is establishing formal, ongoing training requirements for practitioners to maintain their standing. Courses are being designed under international requirements in the important technical disciplines of the profession.

The industry faces few skills development gaps as ARIDO will be supplementing on-the-job training with formal programs. Courses in computer-aided design and drafting may be helpful to the industry as it adopts advanced technology.

Industrial Design

Industrial designers create and design specifications for products. The profession requires understanding of visual, tactile, safety, and convenience criteria as well as psychological, physiological, and sociological factors. Industrial designers can be major contributors to the success of the manufacturing sector. However, in Ontario the industry is a very small one, employing fewer than 1,000 people province-wide.

When recruiting, design firms typically look for graduates from accredited schools of industrial design. Carleton, the Ontario College of Art, and Humber are the main educators in industrial design. After hiring, skills are developed primarily on-the-job with junior people working with more senior people on a project basis. Designers believe that four or five years of experience is required to build proficiency.

Skills development is not seen to be a major issue by industrial designers. They tend to be satisfied with the quality of Ontario's graduates. They are well-educated individuals who through their experience stay abreast of technological developments. The real challenge faced by the profession is to stimulate demand by manufacturers who tend to be foreign-owned and therefore may not be responsible for product design or who are unaware of the benefits of industrial design.

Fashion Design

Like the other design industries, fashion design requires both creative and technical skills. Fashion design, however, tends more to specialize its skills - separating the roles of the creative designer and the technical person who must translate conceptual sketches into production-ready patterns. Creative designers must have an awareness of fashion trends and artistic talent as well as a solid foundation of the technical requirement of textiles and production factors. This is true both for staff in manufacturing settings and for freelancers. Design support staff must have an appreciation for aesthetics but, most importantly, must have well-developed technical skills.

Foundation skills are developed in Ontario's colleges. Ryerson has a four-year program which exposes students to all aspects of fashion design. Other schools offer two-year programs. But the principal avenue for skills development is on-the-job training and practical experience. Designers generally train their support staff for three to six months before they can work without supervision. Designers themselves gain experience as support staff before promotion to the design position within a manufacturing operation or before launching a design firm on their own.

Employers in this sector report some frustration with the technical skills being developed in design programs. Entry level positions in industry are usually at the pattern-making and grading level and much training and supervision is required. Employers have suggested that colleges place more emphasis in the two-year programs on the less "glamorous", but equally important practical side of fashion design which involves linking creative drawings to the production floor.

Other training issues in this industry relate to the introduction of computer-aided drafting and design which is occurring more quickly among larger manufacturers than small. But even small manufacturers are less concerned about the impact of technology on training than about entry-level knowledge of the fundamentals of pattern-making and grading.

BROADCAST AND FILM PRODUCTION

The Industry and its Skills Requirements

In employment terms, broadcast and film production is a small industry. In Ontario, private television broadcasters employed 2,644 people in 1985 while CBC employed 3,929 full-time staff in 1986. Cable broadcasters employed 2,494 people in 1983. With the CBC cutbacks and limited employment growth in private operations, overall broadcasting employment is essentially static.

On the other hand, the film production segment has exhibited substantial growth over the past five years. According to Statistics Canada, the Canadian film production industry consists of more than 300 establishments, compared to 232 in 1979. Nonetheless, full-time employees numbered under 1,000 with salaries and wages of $14.5 million plus freelancers' fees, estimated at $20.8 million (1983). Motion picture laboratory operations and production services employed 931 in 1983, up from 696 in 1978. The vast majority of this activity is concentrated in Ontario.

It should be noted that since 1983 there has been rapid growth in Ontario film production stimulated largely by American-financed work. The Ontario Film Development Board estimates that current employment and expenditure levels are at least double those listed above.

Estimates place the value of total film and broadcast-related expenditures at $1 billion.

In terms of employment and training, there are five major "players" in this industry:

- broadcasters who employ the full range of skills;
- independent producers who typically hire freelance technical crews on a project-by-project basis;
- laboratories which employ post-production specialists;
- unions which represent freelancers in both film and broadcasting and some full-time staff broadcasting;
- government agencies who facilitate the domestic production of feature films.

The broadcast and film production industry has diverse skills requirements. It requires three general types of skills: technical skills used in the production of sound and picture images for film or videotape from set design to camera operation; post-production skills where raw images are transformed to a final print or tape; and maintenance skills for the care of sophisticated electronic equipment.

Current Training Activity

A number of Ontario colleges and universities provide the foundation skills for this industry. However, college and university diploma programs are generally considered to be an entrance requirement only.

Entrants to the industry in production and post-production must start at the bottom, performing manual labour in the studio or on location. Junior people gain exposure to operations, observe skilled practitioners and develop contacts within the company or the industry. This process gives employers the opportunity to observe and evaluate the entrants' interests, work habits, interpersonal skills and overall performance.

As vacancies are created and interest developed, people move into special technical areas where they gain on-the-job experience. "Hands-on" experience is the primary approach to skills development in the industry.

Broadcasters take the lead in training in each of the three employment categories. Unions oversee the skills of their freelance members to ensure proper salary grading and provision of qualified staff to independent producers.

In most cases formal training programs play a limited role in developing production and post-production skills. Financial constraints, lost productivity and the lack of outside specialized training opportunities are the major reasons cited. However, even with the removal of impediments to formal training, most believe that on-the-job training is the most productive approach to skills development. The production setting provides great opportunity for inexperienced staff to observe, discuss and participate in carrying out specific technical functions. However, unions and broadcasters would like to offer more formal training opportunities as supplements to on-the-job training.

In the maintenance area, skills are developed with a combination of formal and on-the-job training as each piece of equipment has a maintenance and trouble-shooting regimen that can be taught in a classroom setting.

Training Gaps and Opportunities

While the overall reliance on on-the-job training is working in a satisfactory manner for employers, some difficulties exist. The lack of formal development opportunities is resulting in some technical shortages in the independent film production segment. Women are being blocked from some technical areas by the entry requirements for physical labour. In some instances, college programs are considered to leave graduates insufficiently prepared for making the leap into the industry. Divisions among industry players have to this point precluded the possibility of cooperative skills upgrading programs.

OPPORTUNITIES TO ENHANCE SKILLS DEVELOPMENT

Research into training demands and processes in these five sectors has revealed that, despite considerable diversity among the sectors, some broad issues can be identified, which are relevant to all or some of these industries. These are:

The Extent of Formal Versus On-the-Job Skills Training

Each of the industries studied has adopted varying approaches to formal versus on-the-job training. The greater the ability to standardize skills requirements and to take advantage of economies of scale, the more likely an industry is to use formal training - a finding similar to the manufacturing sector. Service industries which are fragmented by the company size and skills diversity tend to rely on on-the-job training. In these instances, few formal training opportunities exist and budgets are small. This reveals opportunities to bring together the participants in service industries to identify formal training possibilities and gather the resources to realize them.

The Role of Industry Associations

Industry associations play a critical role in many of the service industries in identifying training needs and bringing together resources to meet these needs. Associations are often central in bringing about standardization of training requirements and setting criteria for accreditation, thus creating an environment in which training is recognized and rewarded. Research has indicated that associations play an important role both in industries where the member firms are primarily small -- as in interior design -- and in industries comprised of large firms -- as in banking.

The Training Implications of Part-time Workers

Service industries tend to rely more on part-timers than the manufacturing sector. In this study two industries were significant employers of part-time staff -- financial services and hospitals. Research indicates that to date, the training focus in these industries has been on full-time staff.

The Impact of Technology on Training Requirements

Technology is being adopted in varying degrees across the five industries studied. The financial services and installation, maintenance and repair industries have been most affected by advances in electronics and face difficulties in upgrading skills in response. In financial services, affected employees have clerical skills which may not be readily transferable to the demands of technology. Similarly, in installation, maintenance, and repair, people cannot easily move from electro-mechanical to electronic equipment. Other industries are making an easier transition as technology improvements are transparent or friendly to the operator or where staff have an educational background which makes the technology less frightening.

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The Importance of Foundation Technical Skills

The study identified the importance of foundation technical skills in service industries. Each of the service industries studied has a highly technical component which requires a solid base of foundation skills for entry and progression by employees.

Women and Careers in Service

Women face impediments to advancement in some of the industries studied. In some cases these are the result of historical trends and practices which may be self-correcting. However, in others, institutional blockages and the lack of awareness or interest among women in certain careers are contributing factors.

The Role of Train-the-Trainers Programs

The incidence of train-the-trainers programs is limited outside of financial services and to a lesser extent broadcast operations. Given the industries' reliance on in-house, on-the-job training, an increase in the use of such programs could increase the effectiveness of skills development.

The Importance of Management Skills Development

The development of management skills is an important issue facing many of the industries studied. In many instances, people with technical expertise are placed in supervisory and administrative positions without the benefit of formal training in management skills. Efforts to enhance skills in this area would increase competitiveness of firms and industries.

INTRODUCTION

THE IMPORTANCE OF THE SERVICE SECTOR

The service industries, which are usually defined as those which are not goods producing, are the major source of Ontario's economic activity in both output and employment, accounting for 67 percent of the provincial GDP and 75 percent of employment. Services are not just ancillary to the industrial economy -- they truly add economic value and are a major factor in international competitiveness.

The service sector's strategic importance to Canada's trade activity cannot be overlooked. Service industries support traded business activity: the banking system has given important support to the international activities of Canadian firms; and our exports of goods are largely dependent on an efficient network of transportation services. Service industries, in many cases, depend on leading edge technology: the telecommunications industry has supported the development of state-of-the-art switching equipment. Service industries also provide crucial markets for Canadian manufacturing: Ontario Hydro played a major role in the emergence of the Canadian nuclear energy industry.

Signs are pointing towards increasing international competition in service industries. Competitor nations are carrying out major studies and focussing attention on the service industries. Major manufacturers like General Motors are aggressively pursuing their service sector strategies. And for domestic service industry firms, this will mean increased cost pressures arising out of productivity and market entry pressures, changing strategic alliances, and increased domestic rationalization of the traded services industries.

Equally important is the basic domestic impact of the service industries. They are largely indigenous operating entities with many key decisions made in Canada. Many are small and entrepreneurial in nature. Their labour content is high and employment continues to grow.

THE NEED TO ADDRESS TRAINING ISSUES IN SERVICES

The Ministry of Skills Development has identified the growing service sector of Ontario's economy as one that presents major human resource challenges. To date, little explicit attention has been devoted to training in the service sector, despite the fact that it has been growing and changing rapidly. As technology diffusion and global competition make their impact on the service sector, a myriad of new work tasks and skill training needs are emerging. Ongoing training will undoubtedly play a major role in equipping the service sector to respond to the challenges it faces and to capture emerging business opportunities. Training programs, to be effective, must focus assistance on areas within the service sector where the needs are greatest and where investments in training will provide the most significant economic payoff.

STUDY OBJECTIVES

The objectives of the study are:

- To identify and describe the major trends in skill demands -- both current and emerging -- in selected Ontario service industries;

- To outline the broad training requirements associated with these trends and the barriers firms face in meeting these requirements; and
- To identify opportunities for enhancing the availability and effectiveness of training.

STUDY FOCUS

The selection of industries for study was guided by three criteria: industries exhibiting extensive linkages to the manufacturing sector; services which are or could be exported; and those industries classified as relatively knowledge-intensive.

Manufacturing Services Services which affect the productivity of the goods-producing sector play a major role in contributing to growth throughout the economy. Service-related activities have been, and will continue to be, fundamental in determining the performance and competitiveness of Ontario's manufacturing sector.

A key factor driving the demand for manufacturing services is the widespread adoption of automated technology which has transformed the content and organization of tasks in the goods-producing industries.

There has also been a marked trend to "spin-offs" from the secondary sector. Services previously provided in-house at the larger manufacturing firms -- such as training or marketing -- are increasly contracted out to independent firms. In addition, smaller businesses, unable to provide such activities in-house, often commission outside firms to provide specialized services.

The mounting competitive challenge confronting Ontario's manufacturers is contributing to the demand for new services. Competitive pressures associated with the emergence of extensive domestic distribution and retail networks, combined with intensifying competition from developing countries, are giving rise to the demand for a range of new services which will assist domestic manufacturers in establishing a competitive edge in the marketplace.

Tradeable Services While the majority of service industries are not export-oriented at present, the service sector is facing increasing pressure to develop and export its expertise. Reflecting this trend is the unprecedented expansion of global trade in services which is outpacing the growth in international merchandise trade. Canadian service exports alone amounted to $21.4 billion in 1985. As softening world demand and stiff competition from developing countries curtails growth in traditional exports of resources and mass-produced goods, industrialized nations are coming to rely heavily on growth in service exports.

Estimates indicate that the value of Ontario's service exports for 1985 was in the vicinty of $10 billion. While the province has achieved internationally competitive status in such fields as banking and life insurance, there clearly remains much untapped export potential in the service sector.

The realm of services identified as "tradeable" is extensive. The well-developed networks in the global marketplace have effectively removed a number of restrictions which once precluded service exports. Education, health care, construction, agricultural technology, environment and natural resource planning, transportation, telecommunications, tourism, trading houses and a wide range of business services represent a cross-section of activities possessing substantial export potential.

Knowledge-Intensive Services The greatest employment growth registered in Ontario's service sector over the last 40 years has been in knowledge-intensive services. These activities involve a wide range of sophisticated skills and constitute the major source of higher-paying jobs within the service sector.

The expansion of knowledge-intensive industries is expected to contribute to the majority of employment gains realized in the service sector over the next ten years. Domestically, the continued trend of "spinning-off" services to outside firms and the emergence of new service demands of the manufacturing sector will sustain growth in the complex services.

Intense competition in foreign markets will provide further impetus for enhancing knowledge-intensive services. As Ontario's comparative advantage moves away from goods-production into the realm of sophistcated services, an emphasis on developing high value-added, leading-edge expertise will be necessary in permitting export expansion to markets abroad. The newly-industrializing countries, while active in goods-production, will rely on imports of complex technology and know-how which will assist in establishing their infrastructure.

The speed with which the benefits of technology diffusion are translated into productivity gains will rest heavily on the ability of the workforce to absorb and accommodate the new technology. Skills training in the knowledge-intensive processes will figure prominently in ensuring that redundant skills are updated or replaced with the shortest possible lags.

Among those industries offering knowledge-intensive services are health care, education, finance, engineering and a wide range of business services such as research, consulting, accounting and software developement.

It is a major assumption of this study that the returns to training investment will prove most substantial in those industries which exhibit some or all of these three characteristics, as they provide the greatest impact on the broader economy and the most meaningful employment opportunities.

Consequently, research was focussed on five service industries that were determined to have strategic importance to the overall competitiveness of Ontario's economy, as defined by the three criteria above:

Financial Services are important on their own account to the provincial economy both in employment and GDP ranking. They provide critical services for the manufacturing sector in providing funds for investment and in facilitating exports. Financial services are highly tradeable. For example, foreign assests account for more than 40 percent of total bank assets. With its traditional and increasing use of technology, financial services are knowledge-intensive.

Hospital Services are also important sources of employment and GDP in the province's economy. With advances in communications technology this sector is becoming more tradeable. The industry is highly knowledge-intensive, and becoming increasingly so with the introduction of advanced technology.

Installation, Repair and Maintenance Services for manufacturers are critical to the province's industrial base, and this importance is increasing with the introduction of highly sophisticated, electronics-based factory machinery.

Design Services aid manufacturers in producing highly marketable products and promoting them effectively. Each of the four design industries -- graphic, interior, industrial, and fashion -- are highly knowledge-intensive, combining artistic talent and solid technical skills. All are tradeable.

Broadcast and Film Production Services are tradeable. They require a high degree of knowledge-intensive skills to translate script ideas into high quality productions. Some parts of the industry -- commercial production and training film production, for example -- contribute to the competitiveness of the manufacturing sector.

STUDY APPROACH

The findings in the study are based on in-depth interviews with firms in each of the industries and with relevant industry associations, unions, colleges and universities. Discussions focussed on the ongoing development of the practical skills necessary for employees in these industries, in response to technological advances and to changing market conditions.

Industry interviews were conducted with line managers and staff people responsible for training. The interviews covered industry overview: size, linkages with other industries, exports/imports, technology, key factors to competitive success; firm background: services offered, employment trends, organization structure, operating systems and methods, training responsibilities; training approaches: corporate philosphy, in-house programs, use of outside resources, existence of an explicit or implicit training strategy, responses to skills shortages, awareness and use of government programs; and preceived strengths and weaknesses in the skills development process.

FINANCIAL SERVICES

THE INDUSTRY AND ITS SKILLS REQUIREMENTS

Financial services industries consist of four pillars -- banks, trust companies, insurance companies and investment dealers. Real growth in the financial services sector, which registered 4 percent in 1986, has outpaced growth in the domestic economy as a whole. Likewise, employment has been growing steadily, increasing by 28 percent since 1982, and more than doubling since 1970. Currently, banks and trust companies are the largest employers in the sector, employing 109,300 in Ontario. Security and investment dealers are the smallest of the four pillars with 27,900 employees. Insurance companies employ 81,300.

Clerical staff represent the single largest employment group in the banking and insurance industries. This group constitutes 71 percent of total employment in banking, with managerial occupations accounting for 25 percent, professional staff in mathematics and engineering representing 3 percent, and sales 1 percent. Within insurance, a heavier concentration on sales is evident at 31 percent, but clerical and related personnel are the single largest category at 49 percent.

Women account for 60 percent of employment in the financial services sector. They also tend to be heavily concentrated in the administrative support area. In banking, women represent 93 percent of the employment in administrative support levels, with salaries in 1986 of less than $22,000. Conversely, women occupied 2 percent of senior management levels. Overall, women account for 73 percent of employment in banking.

Employment growth within banks, trusts and insurance has been highest in those occupational areas dependent on new technology and in financial management. Based on census data, annual growth between 1971 and 1981 was highest in financial management at 29 percent in the banking sector and 17 percent in insurance. Systems analysts and computer programmers experienced 15 percent annual growth in the banking industry and 11 percent in insurance. Total annual employment growth was 6 percent in banking and 3 percent in insurance.

EMERGING TRENDS/TRAINING CHALLENGES

While growth in the financial services industry has been impressive, the industry will nonetheless face a number of critical training challenges and issues in the future. The introduction of new technology has and will continue to result in certain skill shortages and surpluses. Skill shortages are anticipated in such occupations as systems analysts, computer programmers, insurance salesmen, account executives, financial managers and EDP equipment operators. In addition, a number of occupations are expected to be in a surplus situation, according to the 1985 report of the Ontario Task Force on Employment and New Technology. Such occupations include cashiers, tellers, general office clerks, and file clerks.

The four pillars of financial services are becoming less distinct as a result of global pressures and new legislation. Banks are now offering discount brokerage services. Toronto-Dominion Bank, for example, has its Greenline Investor Service and has recently acquired Gardner Group. Trust companies are now marketing mutual funds, such as Royal Trust's Managed Funds. Life insurance companies, such as Laurentian Group are buying brokerage houses.

For their part, securities dealers are selling money market instruments and are involved in merchant banking activities such as arranging leveraged buy-outs.

The erosion of the pillars and resulting demands for efficiently delivered training will present real challenges to the financial services industry. The demand for skilled workers in new areas is increasing -- bankers and trust companies now require training in the securities industry. The need to train personnel in salesmanship techniques is an issue with all of the financial service players due to growing competitive pressures between the pillars. With mounting pressures to extend hours of the retail operations, the banking and trust industries will need to spend more time training part-time personnel.

Technological change is another important factor affecting this industry's training requirements. New technologies were initially installed in the 1960's with microprocessor encoding and batch processing, and technological innovation continues at a rapid pace. 1986 saw the introduction of automated bank machines sharing. In most cases, employment has expanded with new introductions, except during the recession of the early 1980s.

One Canadian chartered bank has estimated that it will spend over $2 billion in the next five years on new technology. One large trust company has indicated that management has recently authorized the spending of millions of dollars on new equipment. A major life insurance company has implemented a company-wide computer system to manage its asset-liability matching in response to pressures on margins and growing competitive pressures to make sound investment decisions. Expert systems are being developed to embody the decision-making rules of experienced securities and foreign-exchange markets.

CURRENT TRAINING ACTIVITY

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Training in the large and growing financial services is clearly recognized as a factor in the competitive strength of the industry. While their levels of commitment to training may vary, each of the financial service players tend to approach the issue in similar ways.

Bank Training

Banks are undoubtedly the training leaders in the financial services industry, with training viewed as an investment in the future rather than an expense. In 1984/85, the seven chartered banks in Canada spent $113 million on training. A total of 82,000 people received training within the banks, representing over half of the total employment of 149,000 full and part-time staff.

Participation of women in training is growing. Women represent 73 percent of full-time employment in the banks and thus the Canadian Banker's Association estimates that women accounted for the majority of the 82,000 hired. In 1971, men accounted for 83 percent of the trainees, but women's share has since grown to over 60 percent.

This training activity does not include informal training programs or on-the-job training and thus the estimate that over half (63 percent) of the chartered banks' employees received training in 1984-85 is probably low.

Training in the banking industry can be divided into three streams, each focussing on a different aspect of employee development:

Formal Internal Bank Training Programs

Content in these programs include lending and finance, management, sales, operations and customer service. The purpose of these programs is to develop proficiency on the job and to increase generic and general skills such as time management, career planning and supervisory skills.

F I G U R E 1

BANK TRAINING

	Job Function	Type of Training	Use of Outside Resources	
↑ more generic concepts, perspectives	Senior Management	current management theory, coaching	high	↑ more individualized, more global
	Middle Management	how to manage people	low	
	First and Second Line Supervisors			
	Lending Officer	collections, lending, telephone manners	low	
			low	
	Customer Service, Tellers	taking deposits, products, service, quality standards	low	

Educational Programs of the Institute of Canadian Bankers

The Institute of Canadian Bankers teaches courses for bankers in a university setting. The purpose of such courses is to increase technical skills, with some programs focussing on general management skills. The Institute's courses culminate in the professional accreditation "Fellow of the Institute of Canadian Bankers". Recently, a new "Professional Banking" program has been introduced as banks are finding that business education levels of new hires has increased.

On-the-job training

On-the-job training is provided to enable an employee to perform a particular job function. This can involve cross-training in cases where an employee learns a number of jobs to accommodate such things as absenteeism and the desire to provide more enriching job experience. On-the-job training is an ongoing process usually conducted by a fellow employee or a supervisor.

Within the banking industry, training tends to become more generic, and more oriented to concepts and perspectives, as one moves up the organizational spectrum. Use of outside, external resources is more common, as is individualized training.

Dissemination of information on training programs is critical. One bank's efforts to involve employees as active partners in their own skill development includes the following measures:

- A manual, listing available training courses, eligibility requirements and applications procedures is provided for new employees;
- At annual performance reviews and in independent statements evaluating their appraisal, employees are asked to indicate what training they feel would best help them to do their jobs and improve their skills;

- Information on training programs is circulated to branches by the regional training centres;
- A booklet which outlines the bank's policy on training and development is distributed annually to each employee;
- An internal newsletter announces new courses and runs articles on training programs; and
- An employee may write to the head of his/her division to request information about eligibility requirements for a particular program.

Trust Companies Training

While trust companies provide on-the-job and management training to their employees, their training commitment is significantly less than that of the banks. One large company estimates that its spending on training is in the $3 to $4 million range, with most other companies doing significantly less. Trust companies estimate that 20 to 40 percent of their staff are engaged in formal training programs in any given year. Although training and career development are part of the individual's evaluation process at most companies, there is often a lack of support at the senior management level for training department's objectives.

The Trust Companies Institute plays a major, although declining, role in the provision of training in technical areas of the industry. The Institute was created in 1974 as the educational arm of the Trust Companies Association of Canada. The Institute offers technical education programs to employees of member companies, which lead to seven specialty areas: Corporate Trust; Pension Trust; Personal Trust; Financial Services; Mortgage Services; and Taxation. Senior industry specialists set professional standards, determine program content, write study materials and assess candidate qualifications for each of the seven areas. In each specialty area, the program has six parts -- an overview of the trust industry, general education requirements, Phase 1 program of self-paced study with an exam, Phase II in-depth study with an exam, a specialist program (like the Canadian Securities Course) and a research project. Once completed, an individual receives the professional designation of Member, Trust Institute (MTI) or a Specialist, Trust Institute (STI), which is like a diploma. Courses typically take one and a half years and candidates must achieve 70 percent on their exams. Member companies recognize the designation as a prerequisite to advancement in the industry, with many offering reimbursement, study leave and bonuses for successful completion.

In addition to the Institute's training program, on-the-job training is conducted entirely by line personnel in areas such as new equipment utilization, credit and customer service training. Although trust companies once relied on the Trust Companies Institute for management training, they are now conducting most of their management training internally with the assistance of outside resource packages. Due to the large geographic networks in which the trust companies operate, training is increasingly being offered using non-traditional vehicles, such as self-study, job-aids and computer-based programs.

Life Insurance Training

Training has become much more important in the life insurance industry over the last two or three years. Training departments and training generally are gaining increased recognition among life insurance companies.

Nonetheless, training budgets in large organizations are smaller than those of banks and trust companies, usually in the $200,000 to $600,000 range. Typically, one-quarter to one-third of total staff personnel are involved in formal training programs in any one year. General skills such as business writing, customer service, supervisory skills and management training are the focus of formal training programs.

The Life Office Management Association (LOMA) provides correspondence training to life insurers through the Life Insurance Institute of Canada. LOMA is an international association based in Georgia which has developed a curriculum of ten life insurance courses. Subjects cover principles of life and health insurance, operations, law, marketing, and accounting systems. Courses take up to five years to complete and lead to the "Fellowship, Life Management Institute" (FLMI) professional designation. The organization has recently introduced a FLMI-M or equivalent of a Masters level program to provide more advanced instruction, particularly in general business and finance areas. The Life Insurance Institute of Canada (LIIC) facilitates this training by providing french translation of course materials and occasionally lobbying LOMA to introduce greater Canadian content into the course material. The LIIC also has a training and development section which acts as a network for trainers in the life insurance industry.

Companies reimburse fees, textbook costs, provide study time, bonuses and provide facilities for students who take and successfully complete the Life Office Management Association Program.

Property and Casualty Insurance Training

This industry relies on and supports financially the training of employees provided through the Insurance Institute of Canada. The Institute was founded in 1899 and is the educational arm for general insurance (property, casualty and reinsurance) in Ontario.

The Institute sets the syllabus of studies, produces Canadian tests, conducts correspondence courses, holds examinations and grants Diplomas for the general insurance business. It provides local facilities to students, arranges evening classes and study groups to supplement courses, makes arrangements for holding exams, maintains libraries and promotes seminars.

Three programs are offered: General Insurance Essentials (GAO) for newcomers needing an overview of the industry; the Associate Program and the Fellowship Program which correspond to bachelors and masters level training in a university.

Total registration in all programs for Canada was 19,500 in 1986, out of total industry employment of 113,600. Ontario represented approximately 40 percent of these totals. Courses for the Associate of the Insurance Institute of Canada (AIIC) include obligatory courses in automobile, liability and property and claims. Optional courses are available in marine, accounting and general insurance. Professional designations of and Fellow of the Insurance Institute of Canada (FIIC) are awarded upon successful completion.

Courses are taught by correspondence and by various universities and community colleges offering evening instruction, and take from two to four years to complete. Companies in the industry recognize these courses and encourage completion by granting study leave, holding classes on company premises and providing bonuses upon completion.

Brokerage Industry Training

Brokerage companies undertake the least training of the four financial pillars. Securities dealers do not offer extensive training programs for their employees. Orientation training and selling skills represent the major efforts, and training is generally not part of the evaluation and career planning process.

Only a few players in the industry are providing any formal training. This handful of firms focus their efforts on generic skills, particularly at the management levels, interview techniques, positive discipline, presentation skills, and delegation of responsibility. Private training companies are used extensively by the firms for management and selling skills training.

Training of operations personnel is provided on-the-job by line personnel, as it is in other financial service industries.

The Canadian Securities Institute is the educational arm of the securities industry, while also providing training to other members of the financial services industry. As the national education body of the Investment Dealer's Association, the Canadian Securities Institute develops and administers educational programs for the securities industry. The core of its offerings are three correspondence courses -- the Canadian Securities Course (CSC) and the two-part advanced Canadian Investment Finance Course. The Institute also provides the Operations Course, the Canadian Options Course and other specialized material required for industry personnel preparing to become branch managers, options traders or partners and directors. Currently, 20 percent of course enrollment consists of employees of member firms, 47 percent are private students and 33 percent are members of other financial institutions.

Demand for securities-related training, however, appears to be rising. Enrolment in the five sessions of the CSC from June 30, 1986 to June 30, 1987 was 11,000. Since the fall of 1987, 10,000 students have enrolled in just two sessions. Heavy demands being placed on these courses are due to rapid employment expansion of the brokerage industry and to the desire of non-brokerage personnel in banking, trust and insurance companies to understand the securities business.

In addition to these industry-wide programs, the Toronto Stock Exchange (TSE) also provides training to its member firms in five areas: an orientation to the securities industry; an operations course for 'backroom' operations personnel; floor trading courses; skills training (writing, presentation); and supervisory training. Certificates are provided upon successful completion of the supervisory program and the operations course. The courses are offered in two formats -- seminar or workshop courses and individualized learning courses taken at the TSE Learning Centre.

Most of the course material is delivered by computer, which allows for the accommodation of individual schedules. The TSE's education and training section has a budget of $450,000 and charges its member firms to cover costs. Roughly 2,000 training days per year are provided by the TSE. Occasionally, it provides customized training programs within a brokerage house. A key objective of the education and training section is to make job-related training available in a modular format which enables firms to have staff trained for specific areas of activity, such as bonds, options, or equity.

TRAINING GAPS AND OPPORTUNITIES

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Gaps In Bank Training

While banks devote tremendous resources to training, a number of gaps or shortcomings were identified in current training activity. These include:

- Training in sales techniques for tellers and others in direct contact with customers;
- Literacy training and 'English as a second language' training, especially for employees who deal with customers;
- Training in the use of new computer technology, to facilitate the large-scale introduction of sophisticated new equipment;
- Training of part-time employees, in response to a wide proliferation of products and extended services provided by banks;
- Securities training to enable banks to develop 'in-house' traders.

Gaps in Trust Company Training

A number of training gaps can be identified in the trust industry. These include:

- The need for salesmanship programs to train tellers and others to identify new customer opportunities;
- The need to develop train-the-trainer techniques, which involve preparing line supervisors and management personnel to train their staff, particularly in large, complex organizations;
- Shortages of trained financial planners;
- Demands for product training in the myriad of financial planning instruments which relate to retirement planning; and
- The need for effective implementation of training plans and procedures for staff to ease the introduction of new systems and technologies.

Gaps in Insurance Training

A number of training needs are evident in the life insurance and property and casualty industries. Some of these are:

- Customer service training designed to develop staff's abilities to handle objections and difficult customers;
- Information systems training to keep pace with the installation of new systems;
- Financial management training; and
- Efficient delivery of training using computer-assisted vehicles and training in off-peak hours.

Gaps in Brokerage Industry Training

Training gaps which surfaced in the study of the securities industry include:

- Shortages of entry level retail assistants and secretaries;
- The need for training of sales assistants;
- Shortages of trained personnel qualified to train employees; and
- An increased training need for account executives in areas such as delegating and dealing with stress.

Industry-Wide Opportunities to Enhance Skills Training

Numerous opportunities exist to enhance skills training broadly in financial services.

- While most large and medium-sized companies in this industry demonstrate a substantial commitment to training, smaller companies often lack the resources, people or dollars to develop training plans and programs. Smaller firms would therefore benefit the most from training assistance.
- Companies have suggested that a stronger emphasis on general business skills in the colleges and universities could effectively lighten their heavy training burden.
- In many companies, there is a general need for training of a generic life skills nature, such as positive discipline, time management and coping with stress.
- For companies in the banking, insurance and trust company businesses, literacy and numeracy training have been identified as areas of concern for employees who are dealing directly with customers.

- There is a growing challenge in addressing the training needs of part-time workers, who are often not a priority of either government or industry training programs.

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PUBLIC HOSPITALS: TECHNICAL AND ADMINISTRATIVE SUPPORT

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INDUSTRY AND ITS SKILLS REQUIREMENTS

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Public hospitals dominate employment in Ontario's health care sector. Hospital employment registers close to 140,000, accounting for approximately two-thirds of total sectoral employment.

Employment can be broadly grouped into three major personnel areas: Nursing; Diagnostic, Therapeutic and Emergency; and Administration and Support. Employment growth has been greatest for Diagnostic, Therapeutic and Emergency. All areas have experienced dramatic growth in part-time employment, up 41 percent between 1979-80 and 1983-84. (Table 1)

Escalating cost pressures confronting Ontario's health care system are presenting public hospitals with a major challenge in areas of effective cost management and optional human resource planning.

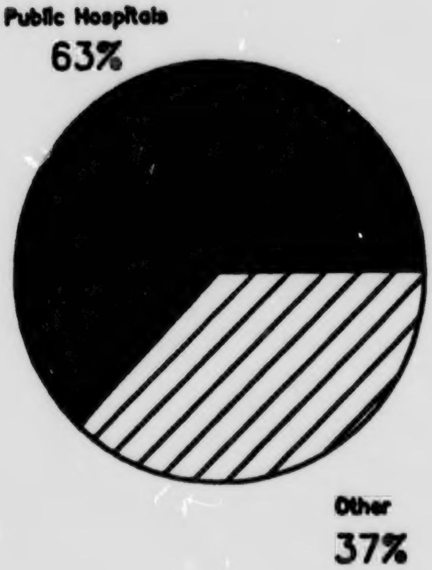
Ontario's elderly population persons aged 65 and over is projected to increase from 900,000 (10 percent of the population) in 1983 to 1,500,000 (14 percent of the population) by the year 2006. Table 2 provides an indication of the pressure on services and costs that will result.

Further contributing to higher health care costs will be advances in medical technology, such as scanning equipment (CAT scans, ultrasound) and more sophisticated operating procedures. Not only will

FIGURE 2

ONTARIO HEALTH CARE
SECTOR EMPLOYMENT,
1985

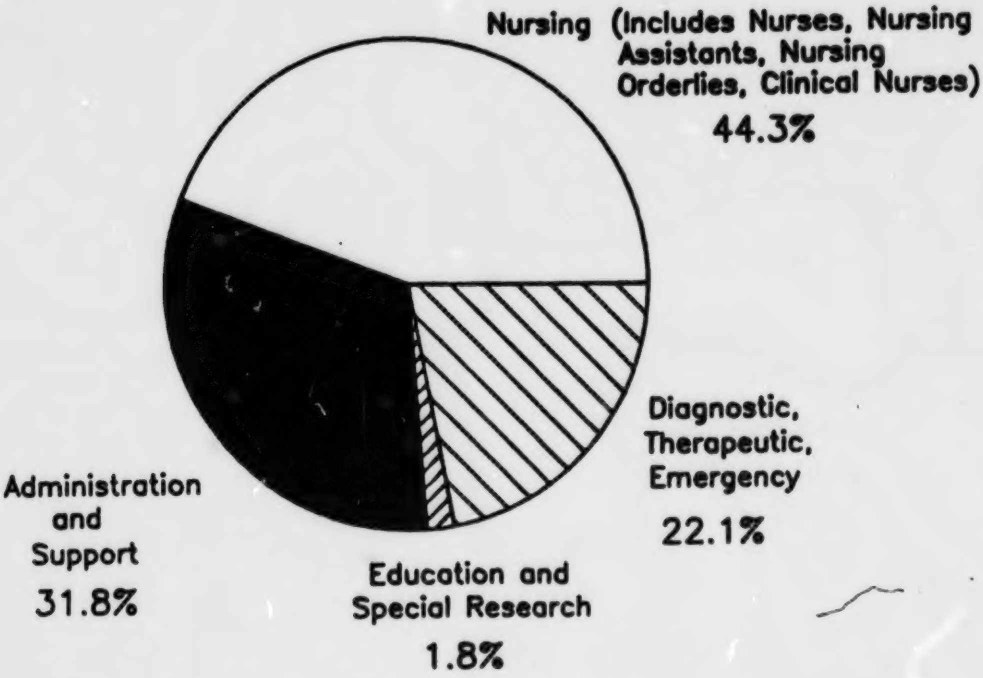
TOTAL EMPLOYMENT 228,683



SOURCE: Background Papers, Ontario Study of the Service Sector,
Ministry of Treasury and Economics, 1986

FIGURE 3

ONTARIO PUBLIC HOSPITAL EMPLOYMENT, 1985



SOURCE: Statistics Canada

TABLE 1

ONTARIO PUBLIC HOSPITAL EMPLOYMENT (THOUSANDS)

	1979-80			1983-84			% Change		
	Full-time	Part-time	Total	Full-time	Part-time	Total	Full-time	Part-time	Total
Nursing	39.2	15.2	54.4	40.3	21.7	62.0	+3	+43	+14
Diagnostic, Therapeutic and Emergency	19.1	4.4	23.5	21.8	6.8	28.6	+14	+55	+22
Administrative and Support	29.6	8.5	38.1	30.5	11.1	41.6	+3	+31	+9
Education and Special Research	4.9	.1	5.0	5.4	.1	5.5	+10	--	+10
Total	92.9	28.1	121.0	98.1	39.7	137.8	+6	+41	+14

SOURCE: Statistics Canada

TABLE 2

REPRESENTATION OF SENIORS IN ONTARIO

	Current % Importance Of Seniors
Population	10
Acute Care Days	40
Chronic Care Days	80
Extended Care Patients	91

SOURCE: Background Papers, Ontario Study of the Service Sector, Ministry of Treasury and Economics, 1986.

applications of new medical technology have a cost, but attendant rehabilitation and ongoing medical care costs will be incurred for those whose lives are prolonged by new technology.

While employment in public hospitals covers approximately 200 specific health disciplines, this study will focus on training needs in the technical and administrative support areas. Three particular skills groups are addressed in the study: management skills; information processing capability; and nursing requirements. Training challenges confronting these three skill groups will be discussed in turn.

Hospitals face a unique set of issues in developing effective management skills. Doctors, nurses and allied health care personnel are trained for specific tasks related to delivery of health care, rather than management responsibilities. Health care professionals do however hold the majority of management and supervisory positions, which are estimated to account for 8 to 10 percent of total hospital employment

Current Training Activity

Formal university or community college training is minimal in the context of a system with 11,000 to 14,000 managers and supervisors. Only three Ontario universities (Ottawa, Toronto, McMaster) offer Masters programs in Health Administration, graduating 40 to 50 students per year. There are no undergraduate or community college programs in Health Administration.

Several hospitals, particularly the larger institutions, have developed their own management development programs, using internal training resources and often outside professionals. Training covers basic management skills such as leadership, supervision, performance appraisals, budgeting and control, and oral and written communications.

While there may be some degree of informal cooperative program development through the sharing of experiences, hospitals generally develop their own individualized approaches to management training. As a consequence, program content and discipline can vary considerably from one hospital to another. In some instances, investment in management development programs has represented part of an overall hospital enhancement strategy.

Many hospitals, especially the small and medium-size ones, take advantage of management courses and seminars offered by the Canadian Hospital Association (CHA) and the Ontario

Health Association (OHA). These associations offer their courses independently of the other, although there is considerable overlap and similarity of course structure.

The CHA courses are all administered through distance education, complemented by up to two weeks per term of centralized classroom training. The OHA offers both distance education and standard classroom training at many locations across the province, often at community colleges.

The CHA offers five management development programs with total 1987-88 enrolment of over 700 students. Details of the programs are outlined in Table 3.

The OHA offers a basic Applied Management Skills Development certificate program for newly appointed managers and experienced supervisory personnel. The program entails two 30-hour classroom series (also available through Distance Education Services) covering basic skills for effective health care management. Following the successful completion of Series I and Series II, seven advanced courses are required for OHA's Diploma in Clinical Administration. The advanced courses are offered in blocks of two or three days and include: Team Building; Innovation; Financial Management and Budgeting; Essentials of Health and Labour Law; Productivity; Executive Leadership; Community Services; Management Assessment Program; Applied Research Methods; and Computer Systems in Health Care.

The OHA has also developed two programs in conjunction with the Registered Nurses' Association of Ontario (RNAO): Clinical Leadership for Staff Nurses; and Design and Delivery of Programs in Health Care Education.

OHA class sizes average about 25 students. In 1986-87, the OHA registered approximately 1,800 students across Ontario. Fees for the Series I and II programs are about $300 each while advanced courses cost about $400 each. Participation and funding arrangements for CHA and OHA courses vary. In some instances courses may be arranged for

T A B L E 3

CHA MANAGEMENT PROGRAMS

Course	Eligibility	Duration	Cost	1987-88 Ontario Enrolment
Health Services Management	Senior management position in a Canadian health organization	Two years (September-April plus two week classroom training each May)	$800 annual fees plus $100 for books	47
Departmental Management	Managerial/ supervisory position in any department of a health care facility	One year (August-March plus one week classroom training in April)	$700 fees plus $100 for books	160
Nursing Management	Registered nurses, approved by Hospital Administrator or Director of Nursing	One year (September-April plus four-day introductory seminar and one-day concluding conference)	$600 fees plus books	368
Food Service Supervision	Supervisory position in health care food service department	One year (August-May) plus eight day classroom training in May	$600 fees plus $60 for books	72
Long-term Care Management	Senior management position in long-term care facility	Two years (September-March plus two week classroom training each May)	$700 annual fees plus $100 for books	58
TOTAL				705

and funded by a hospital (sometimes qualifying for government subsidies); sometimes participants may attend on their own initiative and at their own expense.

Training Gaps and Opportunities

Management training courses provided by the CHA, OHA and individual hospitals are undoubtedly making a significant contribution to developing hospital management skills. The effectiveness, however, is restricted by their uneven application. The wide variation in the quality of training offered, and perhaps more importantly in the opportunity for personnel from different hospitals to participate in management training programs, may contribute to an inadequate base for marginal competence across the public hospital system. Finally, it may not be cost effective to have the CHA, OHA and individual hospitals designing management training programs more or less independently.

The efficiency and effectiveness of management training might be enhanced by adoption of a more standardized approach.

- Universal courses could be designed with input from the OHA, CHA, hospitals, and the community colleges, thereby avoiding duplication of effort and resources.
- More standardized course content and testing would contribute to more universal competence and facilitate inter-hospital hiring.
- Stronger commitments to training and a consistent funding approach would improve upon the current uneven training situation.

INFORMATION PROCESSING CAPABILITY

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Current Training

The Ontario Ministry of Health has called upon Ontario's hospitals to enhance the capability of their statistical and financial information systems. Most hospitals appear well underway in the development of these capabilities.

The hospitals interviewed have adopted their own approaches to systems development in such areas as accounting and medical records, on-line patient information and the transmission of data across hospital departments. Hospitals have indicated that the training of nurses, clerical staff and therapeutic/-diagnostic personnel for work with on-line information systems has been relatively easy. Systems are generally user-friendly and menu-driven, requiring no more than in-house training, or the assistance of system vendors.

The Canadian Hospital Association has published guidelines for the design and implementation of advanced on-line information systems. These guidelines are being tested in hospitals across Canada.

Training Gaps and Opportunities

A number of areas exist in which to build upon existing information system training, currently conducted independently in Ontario's public hospitals.

- The consistency in needs and applications for patient information and record keeping systems in hospitals provides a clear opportunity for co-operation across hospitals. A co-ordinated approach to systems design and training could introduce greater consistency and transferability of skills for hospital systems. A more standardized approach to training would also contribute to greater personnel mobility among hospitals, and could potentially reduce the expense of training.

- Hospitals have expressed concern over the shortage of word processing skills in the workplace. Hospitals which have typically provided word processing training are finding this to be an increasingly a futile investment. Their trained staff are often lured away to the business community, reflecting the fact that this skills shortage is shared by employers in all industries.

- While hospitals appear to face few difficulties in developing necessary on-line information processing skills, a greater challenge may arise in the management of the information generated by the various systems. Information management may emerge as a critical component of overall management skills development.

PROFESSIONAL NURSING REQUIREMENTS

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Current Training Activity

The two largest employment groups in nursing are nurses and nursing assistants, followed by nursing orderlies, clerks and others.

Basic training requirements vary considerably for the various nursing professions. Nurses must obtain a three-year diploma at a community college or a four-year Bachelor of Nursing degree at a university. Less than one-third of practicing nurses have baccalaureate degrees. While approximately 2000 nurses graduate each year from community colleges, roughly 620 graduate from university baccalaureate nursing programs. One-year programs at community colleges are available for nursing assistants. Orderlies and clerks are relatively unskilled positions, requiring minimal on-the-job training.

Regular upgrading of skills is very important in the nursing profession, where staff must continuously keep pace with the rapid advances in health care practice and technology. A particular training challenge exists for specialized areas such as the operating room, critical care and neonatal intensive units. Large hospitals tend to handle their training needs internally, while medium and small-sized hospitals rely heavily

TABLE 4

ONTARIO GENERAL HOSPITAL FULL-TIME NURSING EMPLOYMENT (THOUSANDS)

	1979-80	1983-84	% Change
Nurses	23.1	24.8	+7
Nursing Assistants	8.0	7.4	-7
Nursing Orderlies, Clerks, and Others	6.7	6.2	-7
Total	37.8	38.4	+2

SOURCE: Statistics Canada

on community colleges, and, to lesser extent, on universities.

Training Gaps and Opportunities

Changes in the foundation training of nurses are being considered which will have major implications for retraining and for the role of Colleges of Applied Arts and Technology.

Professional nursing associations are advocating that educational requirements to practice be upgraded to a degree, now offered only by universities. If accepted, it is expected that many of the nurses without degrees -- more than two-thirds of practicing nurses -- would seek skills upgrading and retraining. The trend to upgrading is currently being driven by the tendency of hospitals to restrict hiring or promotion to those nurses with degree qualifications.

Financial barriers and capacity pressures faced by nurses, hospitals and institutions are issues to be addressed in light of this demand for skills training.

MANUFACTURING SERVICES: INSTALLATION, REPAIR AND MAINTENANCE

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THE INDUSTRY AND ITS SKILLS REQUIREMENTS

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Installation, repair and maintenance -- while not traditionally defined as an industry sector -- together represent a group of service-related activities of great importance to the success of Ontario's manufacturing industries. The importance of installation, repair and maintenance is growing, as more and more manufacturers increase their investment in sophisticated electronics-based production equipment and systems.

Because installation, repair and maintenance services cut across all manufacturing industries, there is very little comprehensive data on these distinct services. Canada's manufacturing industries spent close to $20 billion on capital and repair expenditures in 1986. Although provincial breakdowns of this spending are not available, it is expected that Ontario, by virtue of its strong manufacturing base, represents approximately 40 percent of the total.

Capital expenditures account for about 70 percent of the total, while repair expenditures constitute 30 percent. Installation costs are a component of capital expenditures, but specific figures are not available. It is judged that construction and new machinery costs make up the bulk of capital expenditures, as installation costs are often contained in the vendor's selling price for new machinery and equipment. Because repair expenditures and activities are easier to identify, these services will

FIGURE 4

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CAPITAL AND REPAIR EXPENDITURES IN CANADIAN MANUFACTURING INDUSTRIES
(in billion dollars)

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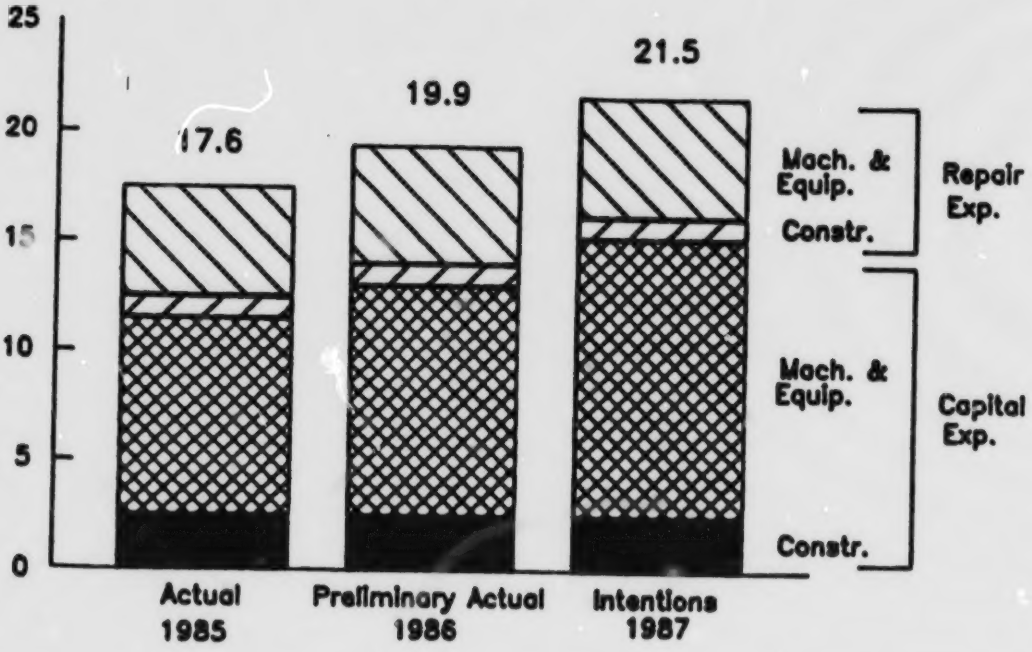

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SOURCE: Statistics Canada

therefore be the subject of most of the analysis provided in this report.

Installation, repair and maintenance services are provided to the manufacturing sector from three sources: contractors; machinery and equipment vendors; and in-house personnel.

Contractors

Contractors to the manufacturing sector tend to be involved primarily in construction, with installation, repair and maintenance usually a secondary part of their business. There are three broad types of contractors: mechanical, electrical and engineering. This study focusses on mechanical and electrical contractors.

Ontario had close to 6,000 mechanical contracting establishments in 1984, with revenues of $2.1 billion and equivalent full-time employment of 28,000 people. Non-residential work accounted for approximately 60 percent of total revenue.

Statistics Canada uses ten trade classifications to describe the type of work done by mechanical contractors. Plumbing is the largest classification by employment and revenue measures, followed by wet heating and air conditioning, process piping, and sheet metal and other duct work.

Ontario had over 4,000 electrical contracting establishments in 1984, with revenues of $1.2 billion and equivalent full-time employment of 19 thousand people. Non-residential work accounted for about 69 percent of total revenue. As a rough estimate, repair for non-residential represents approximately one-fifth of electrical contractors' total revenue.

Machinery and Equipment Vendors

Many machinery and equipment vendors provide a number of installation, repair and maintenance services to their clients. It is common practice for the vendor to be fully involved in the installation of new

TABLE 5

BREAKDOWN OF ONTARIO MECHANICAL CONTRACTORS WORK, 1984

	Percentage		Percentage
Residential	33	New Construction	61
Non-Residential	58	Repair	39
Engineering	9		
	100		100

SOURCE: Statistics Canada

TABLE 6

SELECTED STATISTICS FOR ONTARIO MECHANICAL ESTABLISHMENTS, 1984

Classification	# of Establishments	Equivalent Full-Time Employment (Thousands)	Revenue ($Millions)
Plumbing	2,987	10.6	765
Wet heating and air-conditioning	997	4.2	360
Process piping	60	3.2	266
Sheet metal and other duct work	456	3.6	263
Dry heating and gas piping	879	2.4	172
Commercial refrigeration	304	1.1	68
Automatic sprinkler systems	29	.7	57
Environmental controls	18	.7	55
Thermal insulation	55	.6	41
Millwrighting and rigging	101	.7	30
Total	5,886	27.8	2,079

SOURCE: Statistics Canada

TABLE 7

BREAKDOWN OF ONTARIO ELECTRICAL CONTRACTORS WORK, 1984

	Percentage		Percentage
Residential	26	New Construction	71
Non-Residential	67	Repair	29
Engineering	7		
	100		100

SOURCE: Statistics Canada

machinery, to ensure that it is working properly and to explain and demonstrate to operating personnel. When the equipment is complex and/or the client has limited repair and maintenance capabilities, the vendor will often provide repair and maintenance service on a contracted basis or as required. Finally, the vendor may also train the client's own repair and maintenance personnel to enable the client to handle most or all repair and maintenance problems. The training of client personnel is particularly important for foreign clients who cannot be serviced easily on an ongoing basis, and for clients with continual process manufacturing operations where it is critical to keep downtime to a minimum.

Findings reveal that installation, repair and maintenance is an important part of the business for machinery and equipment vendors. At Husky, about 10 percent of the work force are involved in testing and repair up to and including the installation of new equipment; another 10 to 15 percent provide after sales service. Litton sells its instruments and systems around the world, providing training on a regular basis for overseas personnel. Training programs are usually for 6 weeks but can, in rare cases, be up to 9 months. Because of the labour-intensive assembly process at Litton, most of its direct production staff is capable of performing product repair and maintenance work.

Manufacturer In-House Personnel

Manufacturers generally prefer to use their own staff for repair and maintenance. They consider outside service -- both contractors and vendors -- to be very expensive. As well, as noted earlier, manufacturers with tight production schedules demand instant attention to repair needs, which contractors and equipment vendors can't always provide as well as in-house personnel.

Manufacturers recognize however that contractors and vendors can provide a valuable service. Contractors and vendors are often necessary for unusual or peak work requirements such as major equipment installation, where the capabilities and capacity of in-house staff are insufficient. Some medium and small manufacturers may not have the scale to justify training and retention of fully qualified repair and maintenance staff. Also, many manufacturers find it impractical to try to keep up with the most sophisticated technological service requirements.

There is wide variation across companies in the relative proportion of maintenance and repair staff to the total work force. As indicated above, both Husky Injection Molding and Litton Systems have a large number of employees qualified to do repair and maintenance, but that work is generally performed on the products they are producing. Because of the labour-intensive, on-off nature of their production process, their own repair and maintenance needs are very minor.

Internal repair and maintenance capability appears more important at the companies with a production line or continuous service orientation. At Lever Brothers, a soap and detergent manufacturer, about one-quarter of the factory employees are designated as repair and maintenance workers, including packaging mechanics, machinists, millwrights, welders, painters, carpenters, electricians and electrical technicians. At Samuel Son & Company, a steel processing operation, less than one-tenth of the factory employees are repair and maintenance workers, including carpenters/utilitymen, millwright mechanics, welders, knife grinders, lubricators, electricians and electronics electricians in training. At Ontario Hydro, about 40 percent of the thermal plant employees are either mechanical maintainers or control maintainers.

The wide variation makes it difficult to estimate the number of repair and maintenance workers in Ontario's manufacturing sector. With estimated manufacturing employment (excluding management and office staff) in Ontario of about 750,000, based on available Statistics Canada data, an estimate of 15 percent for repair and maintenance workers yields a projection of 110,000 manufacturer in-house repair and maintenance personnel.

EMERGING TRENDS/CHALLENGES

Skills Shortages

A number of maintenance, repair and installation-related occupations have been identified as experiencing shortages, reflecting the recent construction boom and the increasing importance and demand for electronics-related skills:

- Welding
- Plumbing
- Construction electricians and repair persons
- Electrical and related equipment installation and repair
- Electronic and related equipment installation and repair
- Inspecting and testing electrical, electronic and related equipment
- Machine maintenance
- Precision instrument repair
- Electrical engineering technician/technologist
- Electronic engineering technician/technologist
- Industrial engineering technician/technologist
- Mechanical engineering technician/technologist
- Robotics engineering technician.

The availability of skilled labour for installation, repair and maintenance is directly affected by the level of new construction activity. During the construction boom of the last four years, many trades have been in short supply, particularly electricians. Because repair and maintenance represent a secondary part of most contracting firms' business, it is expected that in times of high demand, and limited supply, resources will first be allocated to construction.

Trades associations are cautious in reacting to increased demand, reflecting their concern that too many of their members would be unable to find sufficient work in an economic downturn.

Technological Developments

Manufacturing companies are adopting electronically-controlled technology at an ever increasing rate. Various electronically controlled systems are being installed and upgraded throughout the operations of many manufacturing companies, such as:

- CAD/CAM systems;
- Numerically controlled (NC) machinery;
- Programmable logic controls (PLC);
- Robotics; and
- Computer information processing, such as Statistical Process Control.

The pace of change seems to be accelerating. For example, Lever Brothers installed a state-of-the-art computer controlled detergent production system in 1983, which is now considered obsolete.

The increasing productivity gains resulting from the application of electronics-related technology are causing repair and maintenance to become more important to a manufacturer's success. As manufacturing becomes more capital-intensive, and fewer line workers are required, it becomes more critical to keep the machinery and equipment working properly. Ontario Technology Centres have indicated, however, that many manufacturers are not maintaining their machinery effectively, in part due to the desire to run at or above full capacity and also due to inadequate in-house repair and maintenance skills and understanding of proper maintenance needs.

CURRENT TRAINING ACTIVITY

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There are four major training sources for installation, repair and maintenance workers in Ontario; traditional trades apprenticeship programs with contractors, apprenticeship programs with manufacturers, full-time college training, miscellaneous training and upgrading.

Traditional Trade Apprenticeship Programs With Contractors

One long standing approach to training for skills related to installation, maintenance and repair has been for a person with some level of high school education (depending on the trade) to become an apprentice with a contractor or employer specializing in that trade.

The apprenticeship program typically lasts for three to four years, with the apprentice learning through a combination of on-the-job and classroom training. The classroom training is provided by the community colleges, with the federal government paying for tuition and unemployment insurance, while the apprentice is at school, and the provincial government administering the program. The apprentice receives on-the-job training while working with established journeymen. Journeymen-to-apprentice ratios range from 3:1 to 5:1, typically higher for union contractors then non-union contractors.

In the year ended March 1987, approximately 1,800 installation, repair and maintenance related apprenticeships were completed.

Employer-based Apprenticeship Programs

Manufacturers' apprenticeship programs in repair and maintenance skills are relatively recent development, resulting from a combination of two factors:

- Difficulties in attracting and hiring skilled tradespeople to do repair and maintenance-related work; and

TABLE 8

ONTARIO APPRENTICESHIP COMPLETIONS AND CERTIFICATE OF QUALIFICATION RENEWALS FOR YEAR ENDING MARCH 1987

Trade	# Apprenticeship Completions	# COQ Renewals*
Plumber	244	5,000
Steamfitter	81	2,300
Sheet Metal	177	2,400
Electrician	634	13,300
Refrigeration	188	1,050
Glazier and Metal	23	NA
Construction Millright	58	NA
Sprinkler Fitter	11	NA
Total Repair/Maintenance Related Construction Trades	1,416	
General Machinst	189	NA
Industrial Mechanical Millright	194	NA
Total Repair/Maintenance Related Industrial Trades	383	
Total	1,799	

*COQ renewal total projected on 9 months actual.

- Perceived opportunities to develop better qualified people for specific manufacturer requirements than either traditional trade apprenticeship or full-time college technical programs.

Ontario Hydro appears to have pioneered in-house apprenticeship programs. Beginning in 1972, Ontario Hydro developed two apprenticeship programs for their thermal plants: mechanical maintainers, combining mechanical skills such as mechanic, welder, pipe fitter; and control maintainers, combining instrument mechanic and electrician skills. Ontario Hydro took responsibility for both on-the-job and classroom training for its programs. The programs take four years before a COQ is obtained (registered with and supported by the Ministry of Skills Development) and are followed by another two years of very specialized training related to the individual's specific function.

In other examples of employer-based apprenticeship, Litton Systems and Husky Injections Molding have developed apprenticeship programs in which the firm provides the on-the-job training and Humber College provides the classroom training. Litton's-four year program culminates in qualification as a Precision Instrument Technician. Husky has a two-year program for Mould Manufacturing Technicians, and a three-year program for Injection Moulding Machine Technicians. For both companies, the Ministry of Skills Development has had some involvement in monitoring the programs.

Samuel, Son & Company has developed an in-house training program for millwright mechanics with the assistance of the Halton and Peel Industrial Training Advisory Committee (HAPITAC). The three-year program includes classroom training at Sheridan College. HAPITAC played an important role in the process because Samuel had neither the manpower nor the training capability to develop its program on its own, nor was it aware of the options available through the community colleges. The program is supported by the Ministry of Skills Development.

Full-Time College Training

Ryerson, the 22 community colleges and specialized private colleges like DeVry Institute of Technology offer full-time programs, ranging from two to four years, in a number of disciplines related to installation, repair, and maintenance. Graduates typically earn the designation of technician or technologist. Their training is intended to add a stronger component of theory and conceptual understanding than is developed through apprenticeship programs.

Technicians and technologists are employed by contractors, including engineering contractors, and manufacturers. They can join their companies out of school, or they can be sent to school by their employers. Samuel, Son & Company has enrolled one of its electricians at DeVry Institute of Technology as a means of acquiring and developing a qualified in-house electronics specialist.

Miscellaneous Training

There appears to be a wide variety of other types of training used by employers to develop and enhance repair and maintenance related skills. For less skilled tasks, there is often informal on-the-job training. However, for most trades, the manufacturer will usually hire a licensed tradesperson who has served his or her apprenticeship with a contractor.

Manufacturers and contractors often take advantage of training programs offered by machinery and equipment vendors, so as to keep up with the latest technology. Some employers sponsor part-time or night school training at local community colleges. For example Lever Brothers is attempting to develop its own internal electronics upgrading program based on American teaching materials.

The Ministry of Skills Development has recently introduced a Trades Updating program, offering 30 to 90 hour courses designed to enable skilled tradespeople to update their skills in response to new technologies and changing market conditions. Several courses

TABLE 9

ANNUAL GRADUATION FROM REPAIR-MAINTENANCE RELATED DISCIPLINES, 1985-86

	Ryerson	Community Colleges*	DeVry
Construction Technician/Technologist		128	
Electrical Engineering Technician/Technologist	175	229	
Electromechanical Technician/Technologist		150	
Electronic Technician/Technologist		1,113	600
Heavy Equipment Technician		36	
Industrial Engineering Technician	50	47	
Instrumentation Technician/Technologist		167	
Manufacturing Technician/Technologist		45	
Mechanical Engineering Technician/Technologist	125	452	
Piping Technician		10	
Refrigeration and Air Conditioning Technician/Technologist		59	
Welding Technician/Technologist		91	
Total	350	2,527	600

SOURCE: *1985-86 CAAT Graduate Placement Report are related to repair and maintenance skills, including Electronic Controls, Industrial Electronics, Welding, Sheet Metal, and Robotic Maintenance. The Electronic Controls course, one of the first to be completed, has a total Fall 1987 enrolment of 422 people at ten participating colleges.

TRAINING GAPS AND OPPORTUNITIES

Manufacturers have traditionally relied on the construction trades and technical schools to provide training to help meet their installation, repair and maintenance needs. But increasing difficulties encountered in recruiting qualified electronic technicians suggest that opportunities exist to enhance skills development related to installation, maintenance and repair.

Trades and Apprenticeship

Some employers view immigration as preferable to searching or developing locally trained talent, reflecting a perception that tradespeople from foreign countries have a higher skill level. Several reasons have been advanced in support of this perception:

- Trades have a relatively higher place in many foreign societies than Canada and therefore attract a greater applicant base;
- Training is more rigorous in other countries and certification often requires successful completion of both written and practical examinations; and
- In some countries, tradespeople are retested periodically, thus ensuring that they maintain a skill level that corresponds to technological advances in their trade.

Several issues relating to Ontario's traditional trade apprenticeship programs were highlighted in the study's findings.

Concerns were expressed regarding the standards for earning and maintaining a professional certificate of qualification (COQ). For some trades, qualification is completely time-based, with no testing procedure. In other cases, there may be only a one-time written test. Practical testing of any type is not provided.

There are few built-in safeguards to ensure that tradespeople keep their skill levels up to date once the COQ has been obtained. Given that demand in construction business has been very strong for the last few years, there has been no compelling reason for many tradespeople to invest time and money to upgrade their skills. If an economic downturn were to occur, there could suddenly be a surplus of construction tradespeople who would be more readily employable in the manufacturing sector if they had upgraded their skills.

Some manufacturers would like to see more flexibility in terms of the combination of skills learned by an apprentice, on the assumption that in many cases a "jack-of-many-trades" repairman would be a cost effective alternative to having to use several different tradespeople on various repair/maintenance jobs and would reflect the blurring of traditional craft distinctions due to the impacts of new technologies.

A number of suggestions were put forth as means of improving Ontario's apprenticeship system:

- The development of a more responsive system for dealing with industry and academic suggestions for improving written COQ tests;

- The addition of practical testing procedures in some areas to supplement the written requirements for gaining COQs;

- Enhanced upgrading opportunities and requirements for journeymen in trades where technological advances are a significant factor;

- Working with labour and employers to explore and develop multi-skills apprenticeship programs.

Linkage Between Manufacturers and Community Colleges

Some employers believe that there is no substitute for on-the-job training, which provide specific workplace skills. Others rely on community colleges for graduates equipped with general technical training and a greater maturity and overall perspective than high school graduates.

Nonetheless, most manufacturers are interested and willing to participate in co-operative training ventures with the community colleges. Usually this interest is not dependent on government financial support. However, in the absence of formal structures for developing these cooperative training programs, companies who have established joint training programs with the community colleges appear to have learned of the opportunity through chance contacts with academic or industry association acquaintances.

With many large enterprises struggling to develop appropriate training programs, it is probable that many of Ontario's smaller manufacturers also lack adequate training capability related to repair and maintenance.

Improved training interaction between manufacturers and schools could be pursued by:

- Alerting manufacturers to the opportunities available and helping smaller manufacturers with similar needs to get together to produce training programs with adequate economies of scale; and
- Linking manufacturers (or groups of manufacturers) with community colleges to enable ongoing development and refinement of manufacturer/community college training programs that meet the needs of the community.

Declining Student Interest In Technical Diploma Programs

It has become apparent that there is a wide range of urgent employment needs in well-paying technical trades, especially electronics. It is also apparent that, for various reasons, insufficient awareness and interest in the technical occupation opportunities has been demonstrated by high school graduates. The applicant base for technical diploma programs is declining at a faster rate than the overall student population. A coordinated promotional effort, by government, colleges and employers, could have a major impact.

Electronics Training

Electronics skills are urgently needed in the installation, maintenance and repair sector, as reflected in the growing demand for qualified electronic technicians and technologists.

Some companies who already have considerable in-house electronics expertise, such as Litton, Husky and Ontario Hydro, are able to develop their own on-the-job electronics training programs which may or may not be complemented by classroom training at community colleges.

However, most companies might only need one or two electronic technicians or technologists, and may lack the capability to provide on-the-job training. The rapid rate of technology advances in electronics is presenting colleges and institutes with an enormous challenge in providing state-of-the-art training to these companies, which often rely on college graduates for skilled electronics workers.

One approach which the colleges are considering to deal with the expense of developing and maintaining up-to-date curricula, faculty expertise, and facilities and equipment, is to try to establish centres of excellence in electronics within the community college system, rather than spread scarce resources too thinly across too many schools.

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DESIGN INDUSTRIES

Design industries solve creative problems for clients. They must work within the constraints of space, cost, and physical features to produce creative and technical solutions. Each of the four segments of design -- graphic, interior, industrial, and fashion design -- is a small employer but their strategic importance as service providers to the manufacturing sector is significant and growing.

Designers require both artistic and creative talent and technical skills. The key contributor to successful skills development are the foundation skills obtained at post-secondary institutions. However, as each design problem is in some way unique, designers must rely on practical, on-the-job experience to sharpen their skills. Most design projects are done by teams -- thus allowing junior people to learn from more senior professionals. Few formal training opportunities exist, but practitioners do not see this as a major impediment to industry success, given the importance of practical experience. Interior design is one exception where a strong industry association is taking a lead in developing a formal training regime to supplement on-the-job experiences.

In this chapter, each of the four design industries is discussed in terms of skill requirements, current training activity and training gaps and opportunities.

I. GRAPHIC DESIGN

The graphic design industry assists clients in communicating with potential customers and the public at large. It combines creative and technical skills as a problem-solver for business. Its key skills challenge is to improve the development of highly qualified individuals in post-secondary institutions.

THE INDUSTRY AND ITS SKILLS REQUIREMENTS

Industry Overview

The graphic design industry is small. According to the Ontario Study of the Service Sector, Ontario's graphic design industry employs fewer than 5,000 people, including support staff. Most studios employ fewer than five people. Entry costs are relatively low, requiring capital investment of less than $30,000. Recently, with the advent of sophisticated computer systems for word processing, typesetting, illustration, and layout, many corporations have hired in-house design personnel. Hence, the number of people active as graphic designers significantly exceeds the number of independent graphic designers noted above.

Graphic design is an outgrowth of commercial art. It combines words and numbers with illustrative or photographed images to create visual communication in several media. Its output includes packaging, logos and trademarks, print advertisements, point-of-purchase display material, annual reports, newsletters, brochures, and posters.

Graphic design requires two types of skills: creative and technical. On the creative side, skills are required to:

- interpret client needs into creative concepts;
- develop a creative concept into representative sketch or comprehensive drawing;

- specify colours;
- arrange for and supervise photography or special illustrations; and
- oversee final production to ensure faithfulness to original concept.

Technical skills are needed to:

- specify type style and size for verbal graphics;
- assemble typesetting and photography for engraving;
- work with engravers to produce lithographic plates; and
- oversee final production to ensure faithfulness to technical specifications.

While larger firms use separate specialists for the creative and technical functions, freelancers typically perform all the steps in the design process.

Emerging Trends/Challenges

Technology is being introduced as a productivity enhancement, primarily aiding the technical aspects of graphic design.

Computerized typesetting is well established in the industry, since it is a special application of word processing systems. Most typesetting houses have the hardware to offer rapid turnaround of typesetting requirements and changes. Larger graphics firms have their own typesetting equipment and operators in-house.

Computer-aided design is becoming an increasing important tool for generating different packages and sizes within a graphics line.

The next wave in computer technology is the digitizing of photographs, so that engravers can create plates more quickly and in a less labour-intensive manner.

Most design firms are too small to afford a high level of computerized technology. Those firms that have adapted it have relied on hardware manufacturers to provide initial and follow-up training. Key to successful implementation is continued use and experience on the equipment. In one firm, people were given bonuses if they could demonstrate competence with the computer through self-training.

Designers stress that technology will only be a tool for the individual who has the skills and understanding of the design and production processes. Few, if any, firms will ever employ specialized technologists to operate computer-aided tools. However, some observers see computerization causing a decline in the need for technical specialists. Creative people will work more directly on assembly as information will be electronically stored for call-up and manipulation during the design process.

CURRENT TRAINING ACTIVITY

In design firms, new hires tend to start on the technical side performing the detailed work under the direction of the design creator. The technical skills are important for designers as they need to understand the specific production processes for the medium in which they are working. In addition, a solid technical base is required for the designer to be able to create concepts that are feasible for the detailed drawing stage. Technical people either move into the creative side of the business or remain technical specialists depending on their interests and talents.

Graphic design firms look for qualified individuals from colleges and universities. They expect individuals they hire to possess basic technical understanding and design ability. However, on occasion firms have revealed some frustration with the level of new entrants' foundation skills. According to these employers, graduates sometimes lack the ability to think in commercial terms. While well educated in the more artistic elements of the business, entrants may be less skilled in solving business problems creatively and practically.

On-the-job training is the primary means of skills development once a person is hired. On the technical side, more experienced individuals guide junior people on a project-by-project basis. The main challenge appears to be in teaching individuals printing processes. Creative people succeed on their innate design talents and their knowledge of the technical fundamentals.

Formal training is generally not available given the small size of design firms. The industry association, the Society of Graphic Designers of Canada, provides some seminars and printing plant tours for its members, but it has limited resources and does not have universal membership from the design community.

TRAINING GAPS AND OPPORTUNITIES

The development of foundation skills is the main training issue facing the graphic design industry. As in other design industries, employers seek qualified individuals with creative talents and a base understanding of how the production process occurs. Working with new hires to bridge the gap between post-secondary education and the practicalities of the business world is a major challenge for employers.

The Society of Graphic Designers of Canada is currently an all-volunteer organization with some part-time staff. There is a feeling in the organization that skills development for existing practitioners is not a priority for the association, even if resources were available.

II. INTERIOR DESIGN

Interior design is a multi-disciplinary profession combining artistic talents and technical skills. It is a small industry undergoing healthy growth. Its industry association is taking on a larger role in assisting firms and individuals in skills development.

THE INDUSTRY AND ITS SKILLS REQUIREMENTS

Industry Overview

Estimates place the size of the interior design industry at over 3,000 workers. The industry is divided between salaried designers who work within design firms and freelancers who work independently or in small groups.

Salaried designers tend to work with corporate clients while freelancers are residential-oriented.

Most registered interior designers are full-time employees or owners. Of the Association of Registered Interior Designers of Ontario (ARIDO) members:

- 18 percent are partners or principals
- 53 percent are employees
- 20 percent are self-employed
- 9 percent are contracted designers or freelancers

Nearly 90 percent of employees work on a full-time basis. Many interior designers, unaccounted for in the above figures, work for retailers, furniture makers or decorating materials businesses.

Interior designers are responsible for the design and implementation of the complete interior environment. This includes:

TABLE 10

TYPE OF DESIGN WORK ENGAGED IN

	Salaried		Freelance	
	Does Mainly	Does Some	Does Mainly	Does Some
Corporate Office	58%	75%	23%	65%
Retail	13	29	13	38
Residential	10	25	48	75
Hospitality	10	22	9	18
Institutional	6	21	2	14
Other	3	11	5	13
Total	100%	-	100%	-

- analysis of client's requirements including work flow, interaction of people, and equipment used;
- creative solution for space and facilities planning;
- detailed working drawings and budget cost estimates; and
- project management to oversee design implementation.

The profession brings together several technical disciplines, including: the knowledge of interior construction methods; awareness of building systems and components; understanding of heating, electrical and building codes; use of specialized equipment to produce plans; and experience with furniture, materials and human factors. However, unlike architects, interior designers do not work on the integral safety or the exterior of buildings.

Emerging Trends/Challenges

The industry is currently quite healthy. Annual average earnings of ARIDO designers are $35,000, with almost 40 percent earning more than $40,000. Fee schedules are expected to increase next year: of the partners and principals responding to a recent ARIDO survey, 64 percent plan to raise fees, with average increases between 10 percent and 15 percent. Ryerson, the leading educator in interior design, reports that all of its graduates have secured employment in the last few years. ARIDO has been unable to fill all the requests it has received for people. Overall, the industry is buoyed by the strong construction and renovation activity in the province.

International activity has a limited impact on the industry. With the strong domestic demand, many design firms are fully occupied with local business. One Toronto firm, with a strong international component, developed this business during the 1981-82 recession. To serve foreign demand, Canadian designers tend to establish and staff a foreign office to serve clients, as the business is a personal one, requiring resources close at hand. Foreign designers have enjoyed relatively free access to the Canadian market, while domestic designers report some procedural difficulties in entering other markets.

CURRENT TRAINING ACTIVITY

Three types of training make up the extensive and rapidly evolving training system in interior design: association-directed training and certification; institutional training; and on-the-job training.

ARIDO has been strengthened with the passage of the Association of Registered Interior Designers Act in 1984. The Act granted to members the right to use the designation "Registered Interior Designer" or "professional", but does not exclude anyone from practicing as an interior designer. British Columbia and New Brunswick have similar titles acts.

The Act gave the responsibility for granting the RID designation to ARIDO, thus increasing its role and influence within the industry. ARIDO has established a formal entry regimen into the profession. To receive the RID designation, designers must complete a three or four-year diploma or degree program at a recognized institution. Ryerson and Humber are currently accredited, although several other colleges are upgrading their two-year certificate program to a three-year diploma.

In addition, designers must work in the field for three or four years before being allowed to write qualifying examinations. These are held under the auspices of the National Council of Interior Design Qualifications, a U.S. body. They are two-day sessions assessing technical and practical knowledge. Few candidates pass the exams the first time. A grandfathering process for existing designers has been established.

Ongoing training is an important element of ARIDO's role. To remain registered, designers will be required to earn ten "continuing education units" over ten years. The definition of a unit is yet to be finalized -- it could range from 10 to 100 hours. Courses are being carefully designed under international requirements in the following technical areas:

- building code requirements;
- computer-aided drafting and design;
- heating;
- ventilation;
- air conditioning; and
- design and the law.

For the 1987 industry exhibition, ARIDO sponsored information seminars on marketing of interior design, negotiating skills, how to get published, and brochure design.

The association works with the full range of educators and trainers to develop and deliver its courses. Ryerson has developed courses specifically for ARIDO. U.S. courses are being evaluated for their applicability to Ontario. The Ontario Centre for Advanced Manufacturing (OCAM) is near completion of the Computer-Aided Drafting and Design course.

Course development costs can be significant, but are absorbed by ARIDO. Attendance fees for a seminar or course range from $50 to $250 to cover operating costs. Annual membership fees of $285 fund course development costs. ARIDO has chosen not to pursue government funding until it has a proven track record.

Foundation Skills

Formal education in accredited interior design schools teaches technical skills and practical experience. In the first year, training is devoted to learning the fundamentals and developing essential skills such as drafting and interior detailing, perspective drawing and space planning. In the second year, these fundamental skills are enhanced through small-scale projects, where students develop creative and analytical approaches to problem solving. In the third and fourth years, students are introduced to professional business practices by working on major real-life projects.

Throughout the program students must arrange to work with design firms or customers for course work and summer employment. Placement from accredited institutions does not appear to be a problem, as schools push students to find related employment and demand is strong.

The two-year certificate programs tend to develop residential designers and introduce design concepts to people in affiliated industries. ARIDO does not recognize a two-year program and corporate and retail designers tend not to hire its graduates. Certificate programs expose students to design concepts with less emphasis on the technical skills required for interior design. Students are typically of two kinds: those with a flair for design and an interest in residential work who want a base of knowledge in the principles of design; and sales people in the fabrics, wall covering, and furniture industries selling through interior designers.

On-The-Job Training

Interior design firms look for well-qualified individuals whose skills can be developed on the job. Most design firms have fewer than 10 people and the largest employ less than 100. The small scope does not allow for significant in-house formal training. Employers report that it takes four or five years for a new hire to become fully trained, likening the process to an apprenticeship. In larger firms, designers proceed through two or three levels -- junior designers, designers, and senior designers -- before becoming project coordinators. Training and development take place essentially on the job. Projects are carried out by teams and junior members work under the guidance of more experienced designers.

Training budgets are small. Employers are generally satisfied with the basic skills taught by Ontario's schools. On-the-job training typically provides the development experience necessary for success. In the larger, more structured firms, formal training requirements are identified through the performance appraisal process. Because of the ARIDO requirements, interior designers are self-motivated to pursue continuing education.

ARIDO courses are not seen to be expensive, and in some cases employers will reimburse employees upon successful completion.

TRAINING GAPS AND OPPORTUNITIES

Two major skills development issues have been identified in the interior design sector -- technology implementation and a potential surplus of graduates. The introduction of computer-aided drafting and design carries complications for training. Larger firms are introducing the technology and some are hiring architectural technologists to specialize as operators. Others are training their design staff to use the equipment, relying on vendors and on-the-job learning. ARIDO's course will help the industry adapt to the technology. Smaller firms argue that computer-aided drafting and design will have limited use for smaller, specialized assignments.

There is a concern that schools may begin to turn out too many interior design graduates in the commercial and retail field. Several colleges currently offering two-year certificates are expanding their programs to qualify for ARIDO designation. Demand for existing graduates is healthy, but may not be sufficient to absorb significant increases of supply. ARIDO's mandate does not extend to supply management and it will not turn down any school whose program qualifies for its accreditation.

III. INDUSTRIAL DESIGN

Industrial design is a highly skilled, knowledge-intensive profession. This study revealed no major skills development issues. Rather the key challenge facing the profession is to increase the awareness among Canadian manufacturers of its ability to help increase their competitiveness.

THE INDUSTRY AND ITS SKILLS REQUIREMENTS

Industry Overview

Industrial design is a small industry: industry observers place the total population of independent industrial designers at less than 500. Approximately 300 consulting firms exist in Ontario, none of which employ more than 15 people. Half of the province's industrial designers are assumed to be employed by manufacturers, and half in consulting firms. Overall employment in the industry is therefore less than 1,000.

Industrial designers are often major contributors to the success of the manufacturing sector. According to the Industrial Designers Society of America, the average industrial designer annually affects $114 million of the GNP, the highest impact of any design professional and 77 times the impact of the average architect. The Society also points out that in small entrepreneurial companies every dollar invested in industrial design results in an average of $166 in sales. In larger companies the return increases to $3,333. A Gallup Study found that senior executives rate industrial design as being 60 percent responsible for the success of a product.

An example of the impact of industrial design is Cooper Canada, a leading sports equipment manufacturer, which spent between 50,000 and $100,000 designing its Cooperall, a one-piece protective product. Within five years total cumulative sales reached $50 million.

Another example of industrial design is the new Toronto Transit Commission streetcar, the product of the skills and efforts of Claude Gitman, a noted Toronto designer.

Industrial design creates and develops concepts and specifications that optimize the appearance, function, and value of products and systems for the mutual benefit of user and manufacturer. These concepts and specifications are developed through collection, analysis, and synthesis of client data and converted to clear and concise recommendations through drawings, models and verbal descriptions. The profession requires understanding of visual, tactile, safety and convenience criteria as well as psychological, physiological, and sociological factors.

In working with clients, industrial designers must take a multi-disciplinary approach in dealing with senior management and marketing, engineering and manufacturing staff.

CURRENT TRAINING ACTIVITY

Foundation skills are developed at a handful of Ontario schools. Employers typically hire graduates from these institutions and develop ongoing skills largely through on-the-job experiences.

Institutional Training

Carleton University, the Ontario College of Art and Humber College are the main educators in industrial design.

Carleton is the only Ontario university offering a bachelor's degree in industrial design with enrolment of 115 students over four years, graduating fewer than 20 students a year. Its first year curriculum is similar to that of engineering. Second year introduces students to form and colour fundamentals and mass-production techniques. Third year begins to focus on design studio projects, marketing and psychology. Fourth year revolves around major industrial design projects. Practical work experience is gained between third and fourth years. The school has special equipment and facilities - - studios, workshops, photographic labs, mould shop, video library, and a technical data room.

The Ontario College of Art graduates 10 to 20 students a year in industrial design. The College has established links with the University of Toronto's engineering school.

Humber, Georgian, and Fanshawe Colleges offer three-year diplomas in industrial design.

Skills Development

In hiring people, employers typically look for graduates in industrial design, as the formally developed foundation skills must be present to perform effectively. In addition, college and university programs provide students with the opportunity to develop a portfolio of projects to demonstrate ability and potential.

Cooper Canada is one exception. Its design group has increased from two to six professionals over the last ten years. Some of the additions have been the result of transfers from other groups at Cooper. These transfers have been trained on-the-job to be proficient designers for company products.

In general, industrial designers observe that it takes four to five years for a new hire to become a fully qualified designer. Skills are gained through on-the-job experiences working in teams with more senior designers.

Most firms and design departments are too small for specialization of skills. Each designer, while better in some areas than others, typically needs to be able to assist in any project. Where specific skills require upgrading, employers will pay for attendance at courses at one of the province's industrial design schools.

Computer-aided design is regarded as a useful design tool, and many have installed a system or are considering it. Training for use of the equipment is not seen to be a major issue, as industrial design is a technical profession here practitioners are, by and large, unintimidated by the technology. In some cases, designers are eliminating the need for any significant training requirements by purchasing extremely user-friendly equipment that can be mastered in a matter of hours.

TRAINING GAPS AND OPPORTUNITIES

Skills development is not seen to be a major issue by industrial designers. They tend to be satisfied with the quality of Ontario's graduates. Practitioners and academics have solid working relationships to assist the formal education system. Designers develop their skills through on-the-job experiences and rise through the ranks based on their creative and technical abilities. They are well educated individuals who, through their own experiences, stay abreast of technological developments.

The real challenge faced by the profession is to stimulate demand by manufacturers who tend to be unaware of the benefits of industrial design.

Design Canada, a federal government initiative, was created to stimulate awareness and demand but has been terminated by the government. The program was not seen by the profession as providing significant value. For example, one initiative provided cost sharing for first design projects by manufacturers, but designers found that subsequent projects did not follow, as manufacturers were unwilling to pay full cost once the discount precedent was established.

Furthermore, exhibits sponsored by Design Canada were seen as being aimed at the broad public instead of manufacturing decision makers.

According to designers, where skills development is required is in the business schools. Future managers are not being made aware of benefits of professional industrial design.

European managers, and the public as well, seem to have a much higher level of appreciation for product design considerations. Greater utilization of industrial design might improve Ontario manufacturer's potential for international sales.

IV. FASHION DESIGN

Fashion design entails the full process of developing a clothing design and preparing it for production. The high-profile art of conceiving and sketching design ideas is merely the first step in the development of a design. Skilled design support staff are needed to assist the designer and transform his ideas into samples and patterns ready for mass production. Developing and maintaining a pool of talented design support staff is the main skills development challenge in the industry.

THE INDUSTRY AND ITS SKILLS REQUIREMENTS

Industry Overview

Estimating the size of the design industry is difficult as there is no unified designers association, and firms vary in the number of design staff they employ. Also, designers are active in both the custom-tailoring and retailing sectors. The best way to measure the size and importance of fashion design is to consider the Ontario apparel industry.

Ontario's apparel industry employs approximately 35,000 in 600 manufacturing companies, with annual production at roughly $2 billion. Design and manufacturing are concentrated in metropolitan Toronto. The number of design staff varies considerably among Ontario's apparel producers, but research suggests that there are over 2,000 people active in the design industry in Ontario. Though the numbers are small, the industry is important because it provides the leadership and creative energy for a major Ontario industry.

Designers make up only a small fraction of those employed in fashion design. Each designer has a support staff of at least 6 to

10 working with them. The ratio of support staff per designer varies, depending on the size of the firm: small firms generally have fewer support staff per designer than larger firms.

The principal design positions and their responsibilities are as follows:

Designers:

- conceive and illustrate design ideas using extensive knowledge of fabrics, colors, fashion trends, construction techniques, economics, and creative flair;
- supervise production;
- oversee and train other design staff;
- supervise personnel and financial management (in smaller firms); and
- often sell product through personal contact with buyers.

Pattern-Makers:

- transform the designer's sketch into a practical production pattern, using both technical and creative skills.

Graders:

- alter the pattern to create a full range of sizes.

Marker-Makers:

- lay out the patterns on the bulk textiles to achieve minimum fabric waste.

Sample Makers:

- make preliminary samples for examination and revision by designer and pattern drafter.

Design Assistants:

- perform miscellaneous tasks including pattern drafting, administration, and shipping.

Designers shoulder broad responsibilities and must possess superior skills in every area of the business. Pattern-makers must also possess a complete knowledge of the design process, and utilize both technical expertise and creative flair. The other functions are more technically-oriented but also require considerable expertise. Distinctions between specialties blur with smaller firms where designers and pattern-makers may perform the other steps in the process.

Emerging Trends/Challenges

The fashion design industry in Ontario has experienced rapid growth in recent years. A decade ago, Montreal was the unchallenged leader in Canadian fashion, but today Toronto rivals the Quebec industry.

The major challenge facing the industry, is to increase penetration into the U.S. market and generally improve its international competitiveness. Strong skills and high productivity will be necessary for success.

Computer-aided systems have come into wide use in the fashion industry. Software has been developed to grade and produce production patterns. This breakthrough has resulted in faster turnaround, less manual work and reduced fabric usage in production from more optimal layouts.

The adoption of computer technology in design is largely a function of scale and economics. Firms producing a wide variety of apparel at high-volume levels and with the necessary financial resources, are more likely to implement computer-aided design systems for each step of the process. In some of the small firms, CAD is used for grading and marker-making, although many have yet to adopt this technology.

Industry participants see computer-aided design playing an increasingly important role in the future. But most agree that the computer skills are not difficult to learn. Most CAD systems are user-friendly providing the user has technical proficiency.

Fashion design relies on foundation training combined with on-the-job training for professional skills development.

Employers hire qualified graduates from the colleges for support positions, such as pattern-making, grading or design assistance. In these functions, new hires are exposed to the process of converting conceptual design sketches into reality.

These "designers-in-training" then develop a solid understanding of production, techniques, learning what can and cannot be done on textile production equipment. They gain experience with the production and appearance features of specific types of cloth. And they begin to appreciate the economics of clothing design and production as they work closely with the manufacturing side of the business in costing and new designs. Pattern-makers and graders must develop the ability to optimize a balance between the original intent of the designer and the production and economic constraints of the firm.

In larger firms, four or five years in pattern-making and grading is generally required for an individual to become fully proficient as a designer. Younger people work under the direction of more senior, experienced staff to develop their skills on the job. In the first three to six months of employment, new hires require much of the designer's time for supervision and training. As most designers or manufacturing firms specialize in a type of clothing or fabric, individuals become specialized depending on where they work.

People who demonstrate a high level of ability in pattern-making, exhibit creative flair, and have a strong attitude are then, if an opening occurs, given the opportunity to become designers in their firms. In addition to a solid foundation in the technical aspects of design, these individuals must have a talent for conceptualizing new designs that fit with prevailing market needs and fashions.

An alternate career path is for individuals to strike out on their own or in partnerships. Young designers must secure production capacity from existing manufacturers and retail distribution. Some designers who have perfected their technical skills at a larger operation may decide to be independent designers.

Overall the fashion design industry does not rely on formal off-the-job training for skills development. Colleges provide an introduction to the basic skills for those interested in the field, and technical skills are developed with time and experience.

TRAINING GAPS AND OPPORTUNITIES

According to some employers, the major skills issue in fashion design, is the on-the-job training required for recent graduates. There is a serious shortage of skilled design support staff, and designers argue that they bear an excessive burden when they take on new pattern-makers and graders with limited skills and experience.

BROADCAST AND FILM PRODUCTION

The broadcast and film production industry includes television broadcasters, film producers, television commercial producers and post production laboratories. Many of the industry's employees are represented by crafts unions.

The industry is a mature one, with well developed technical skills that have not undergone significant changes in their requirements over the last 10 to 20 years. It has relied on on-the-job training for development of most of its technical skills and overall this has worked well. Nevertheless, some training gaps have been identified which could be addressed. The industry and its skills requirements, current training activities, and training gaps and opportunities are discussed below.

THE INDUSTRY AND ITS SKILLS REQUIREMENTS

Industry Overview

Broadcast and film production is a well-established industry with diverse skill requirements. There are five types of industry participants -- broadcasters, independent producers, post-production laboratories, unions and government-sponsored development agencies.

Broadcasters either as part of networks or single stations, employ full production crews to put their own regular productions on air. Even the smallest private broadcaster will require production skills to produce its news programs. Some post-production skills are required to receive satellite feeds from the parent network or U.S. program provider. The CBC is the major employer of production and post-production skills in Ontario, generating more of its own broadcast schedule than any other operation.

Independent Producers develop project ideas, secure financing, and arrange for distribution. Programs produced include feature length films for theatrical release, co-productions with broadcasters for television airing, corporate films, educational productions, and industrial training aids. A segment of the industry specializes in television commercials, working with advertising agencies and advertisers. Independent producers typically employ only a skeleton staff, hiring freelancers for production crews through unions or personal contacts. Post-production requirements are secured through independent laboratories.

Post-production Laboratories consist of small and medium-sized companies with the special equipment and expertise necessary to convert raw footage to a finished product under the producer's direction. The labs service independent producers and broadcasters for post-productions or overflow work.

Unions represent freelance production staff and full-time employees at some broadcast operations. For the former, the unions establish pay and working conditions, maintain membership lists and provide staff to independent producers. In some cases they make available their members to non-unionized broadcasters requiring temporary staff. The unions are responsible for standard setting and grading of their membership.

Government Agencies Both levels of government have in place agencies to invest in independent Canadian productions. The Ontario Film Development Corporation, in addition to investing in domestic films, promotes and facilitates foreign productions in Ontario.

Broadcast and film production is a small industry. In Ontario, private television broadcasters employed 2,644 people in 1985 while CBC employed 3,929 full-time staff in 1986. Cable broadcasters employed 2,494 people in 1983. With the CBC cutbacks and limited employment growth in private operations, overall broadcasting employment is essentially static.

According to Statistics Canada, the Canadian film production industry consisted of more than 300 establishments in 1983 compared to 232 in 1979. There were 1,000 full-time employees with salaries and wages of $14.5 million, while freelancers' fees were estimated at $20.8 million (1983). Motion picture laboratory operations and production services employed 931 in 1983, up from 696 in 1978. The vast majority of this activity is concentrated in Ontario.

It should be noted that since 1983 there has been rapid growth in Ontario film production, stimulated largely by American - financed work. The Ontario Film Development Board estimates that current employment and expenditure levels are at least double those listed above.

Estimates place the value of total film and broadcast-related expenditure at $1 billion. A recent surge in the production of television commercials in Toronto has raised this segment of the industry to an estimated $150-200 million annually. American productions have been attracted to Ontario because of favourable exchange rates and tax treatment, more flexible union policies and work roles, and the active promotion of the Ontario Film Development Corporation and the City of Toronto.

Preserving the present prosperity in film production will be the principal challenge facing the industry over the next decade.

Ontario will have to establish itself as a film producer of international stature. Without international acceptance, the Ontario industry will remain perilously dependent on a low Canadian dollar to attract American producers. A shift in the U.S. - Canadian exchange rate, it is generally acknowledged, could put a sudden end to the film production boom.

Improvements in the industry's skills development process would help it meet this challenge. Ontario's film and broadcast technical staff are generally acknowledged as competitive with those in the United States. But more emphasis on skills upgrading could help establish a broader base for world-class personnel. This could lead, in turn, to a more stable internationally competitive industry.

Skills Requirements

Three primary sets of technical skills can be identified in the broadcast and film production sector.

Production Skills These skills, generally provided by the specialists, are required to create and capture images for film or videotape. They include:

- set design
- carpentry
- wardrobe
- make-up
- production assistance
- camera operation
- lighting
- audio recording.

Post-production Skills Skills in this area transform the raw video and audio images to finished form for transmission to a print or video tape cassette. Also provided by specialists, they include:

- editing
- mixing of sounds and images
- colour correction
- graphics
- print duplication.

Maintenance Broadcasters and film producers employ highly specialized, expensive equipment that needs to be kept in good working order throughout its useful life. Maintenance technicians perform preventive maintenance and troubleshooting repairs when problems occur. Maintenance skills are usually provided by generalists since no one piece of equipment warrants special expertise. The types of equipment they maintain include:

- cameras
- video tape recorders
- mobile studio equipment
- switching equipment
- lighting
- audio equipment.

CURRENT TRAINING ACTIVITY

Several post-secondary institutions carry out foundation education programs, and employers look for graduates of these programs for entry level hiring. After that, employers and unions generally take an on-the-job approach to training. Production skills are developed by broadcasters and unions largely through on-the-job experiences. Post-production skills are typically developed in a similar manner. Maintenance skills are developed with a combination of formal and on-the-job training.

Educational Institutions

Ontario's colleges and universities have a series of programs to provide post-secondary education in broadcasting and film production. Three types of programs are offered. Degree programs in Fine Arts & Film Studies are offered at Brock, Carleton, the Ontario College of Art, Queen's, Toronto, Windsor and York.

Two and three-year Television and Radio Broadcasting programs are available at Algonquin, Confederation, Humber, Niagara, Ryerson, St. Lawrence and Sheridan Colleges. These provide a broad overview of the theoretical, technical, and creative aspects of film, video and television production.

Fanshawe, George Brown, Mohawk, Ryerson and Seneca Colleges provide two and three-year Electronics Technology programs for maintenance technicians. Only George Brown has a specialty program in the area of film and broadcasting. Many maintenance technicians receive their college education in Alberta or Quebec.

Most broadcasting and union people in the production area agree that the current formal education process is useful, but some feel that graduates lack relevant, practical training. Employers and union managers see the roles of colleges and universities as providing the basic understanding of the industry and its functions, allowing students to explore areas of interest, and giving young people the opportunities to demonstrate career commitment to the industry. They recognize that experience opportunities with up-to-date equipment are hard to achieve given current funding restraints; however most believe that this experience can be achieved effectively once students are hired.

Nevertheless, a significant minority are concerned that students are not adequately exposed to the practical, business-related skills of producing a commercially viable product. Criticism is also aimed at the unrealistic expectations students have regarding the number of job opportunities there are and the entry levels being offered.

Production Skills Development

For broadcast employees, on-the-job training is the primary means of gaining production skills. Entry level people typically start at very junior positions. In some companies, like the CBC, people take unrelated jobs such as mail delivery simply to get in the door for future opportunities. Entry level production staff gain exposure to studio operations, observe skilled operators and develop contacts within the organization. This process gives employers the opportunity to observe and evaluate people's interests, work habits, inter-personal skills and overall performance.

Graduates seeking employment in broadcast production must start at the bottom in larger broadcast operations or gain experience in smaller stations. With the maturity of the industry and the increasing reliance on co-production, large broadcasters have few hiring requirements. CBC, for example, hired fewer than ten new production people in its Toronto operation this year. Experience is crucial for responsible positions at these large urban facilities, as mistakes can be embarrassing and costly. Consequently, vacancies are filled from within, if possible; but experienced individuals are often hired from smaller stations or the cable industry.

Formal training programs play only a limited role in developing production skills. Production employees typically receive fewer than four days of formal off-the-job training annually; in some operations no formal training is offered.

Financial constraints are an important reason cited by broadcasters for not using more formal training programs. The lost productivity and disruption of staffing schedules are equally important factors.

Many of the functions are so specialized that it is often not practical for a broadcaster to develop a training program for skills upgrading. Some programs do exist, however. The CBC provides the opportunity for production secretaries to attend a formal one-week, in-house course to learn the production assistant function. Other production staff can attend a course to prepare for the next job level, although advancement to higher levels is dependent upon vacancies opening up.

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However skilled practitioners and managers believe that real-life, hands-on experience is the most productive approach to skills development. The production setting provides an excellent opportunity for inexperienced staff to observe, discuss, and in time, participate in carrying out specific technical functions where union restrictions do not apply.

Unions also play an important role in training. Four unions operate on the freelance side of the production segment. These are the International Alliance of Theatrical Stage Employees (IATSE), the Association of Canadian Film Crafts People (ACFC), the Canadian Association of Motion Picture and Electronic Recording Artists (CAMERA) and the National Association of Broadcast Employees and Technicians (NABET).

Like broadcast production employees, most new union members must start at a junior level where hourly rates are lower. Within each function are levels such as trainee, assistant, operator, head, or senior through which people progress as they gain experience and demonstrate capabilities. The unions work to ensure that individuals are properly graded, to provide appropriate people for different levels required by independent producers. At the ACFC, for example, each craft has a group of senior members who approve progressions by individuals through the levels. Experienced technicians and craftspeople can qualify to enter at the appropriate level.

Formal training varies between unions. IATSE requires all new entrants to attend Saturday classes for twelve weeks. The courses are partially subsidized by the Ministry of Labour. A new federally sponsored program is being planned which will be longer and more detailed. ACFC offers training in certain of its skills but intends to develop a more formal training process. NABET provides occasional seminars led by its experienced technicians. While the unions are working at building their formal training capabilities, all agree that on-the-job training is the most important source of skills development.

Advances in technology have not had a major impact on the development of production skills. Non-technical skill requirements associated with make-up, hairdressing, wardrobe, production assistance have remained unchanged from the days of early television.

Technological advances in photography and sound recording have been essentially transparent to operators -- equipment simply performs the same function better and more easily. For example, colour line-up in cameras once took a half hour of manual adjustments. Today the function is performed in minutes with the aid of computer technology housed in the camera. The advances that have occurred eliminate some of the drudgery. Small microphones reduce the need for boom operators. As a result production people are allowed to focus on the truly creative aspects of their crafts.

Post-Production Skills Development

Post-production skills are developed in a manner similar to production skills. Technicians typically gain necessary skills by progressing through the ranks. Technological advances, while pervasive, have not had a major impact on skills requirements.

Post-production technicians at broadcast operations gain the necessary skills by starting at routine assignments and progressing to more complex responsibilities. At CBC and Global, future editors begin at junior production levels and only start to specialize after three to five years. Initial assignments are in video taping programs or news stories from the satellite feed. Editing responsibilities for variety shows, dramas, and other productions arise as individuals become more familiar with equipment and demonstrate creative talents.

Employees have the opportunity to practice their skills on the broadcaster's equipment on their own time. Similarly other specialized post-production skills such as graphics and sound mixing are developed by performing routine work at the beginning and progressing as opportunities come available.

Both CBC and Global rely primarily on hands-on training and individual initiative. CBC is, however, strengthening its formal training program in VTR operation, setting aside classroom space and developing training modules.

As in production jobs, post-production people must first get in the door, often performing unrelated work at the outset. Direct placement from school in these functions is rare.

Broadcasters are the primary trainers in post-production skills for the industry. Independent laboratories typically draw on them for experienced, talented individuals.

The trend to computerized tape editing has not caused major changes in skills requirements. Producers shoot most large-scale feature films, commercials, dramas, and current events programs on film and, despite technological advances in video tape production, film will continue to play a major role. Film cameras are more portable, durable, and repairable; despite technological advances in video cameras they have not yet gained an advantage over film in these areas. Economics favours film cameras because of their longer life than video (15 years versus 3 years). Picture quality is also perceived to be superior with its softer, more graceful look.

However, editing filmed footage via video tape is becoming common. Film is converted to tape, tape editing is done on computer-aided equipment, and the final version is produced by cutting the original film to match the video master tape.

Computerized tape editing does not require more technical skills as the computer simply eliminates routine manual work.

Maintenance Skills Development

Maintenance skills are developed with a combination of formal and on-the-job training.

Maintenance technicians receive frequent formal training to stay abreast of changing technology. At CBC, candidates for hiring must first pass a written test indicating a good aptitude for, and knowledge of, maintenance and repair basics. CBC negotiates with equipment manufacturers to provide training for technicians when new orders are being placed. Corporate train-the-trainer programs are in place to facilitate the transfer of these skills. Tutorials are carried out by engineering headquarters in Montreal. Less experienced technicians work with more senior people to gain on-the-job guidance and experience with specific equipment.

Global starts new hires in the central equipment room, where they perform some fine-tuning of signals and become acquainted with the network's equipment. At the next stage, technicians work in studio maintenance gaining broad exposure to all equipment, except VTRs. VTR maintenance experience in the control room is the third step. Fully trained people are assigned to the mobile units where all types of equipment are used.

Global relies heavily on manufacturers for training, arranging to bring the trainers to Toronto to teach all staff; a video tape is made for later hires or as a reference to supplement the manuals. Lectures are scheduled weekly, led by senior technicians or the manager, on specific repair and maintenance issues.

Colleges are seen to play a useful role in foundation skills development for the maintenance function. Electronics technicians are trained by colleges to repair and maintain general electronics circuitry. Too few broadcast maintenance technicians are hired to warrant much specialization, although George Brown does offer courses related to video systems maintenance. Up-to-date equipment is often difficult to obtain, given its high cost and budget restrictions.

Neither CBC nor Global is overly concerned about the lack of modern equipment in colleges. They are more interested in a broad understanding of technical principles.

Also, as noted above, formal skills upgrading programs could be a means to broaden the base of international-calibre skills in the Ontario industry. The on-the-job training system has provided an acceptable level of skills, but there remain shortages of top-calibre personnel in certain key functions such as camera, sound and lighting, and editing. Formal training opportunities such as intensive "hands-on" workshops, it is widely agreed, could raise the level of skills in these positions as well as others. Strengthening skills with formal training programs could help ensure continued strength for film and broadcasting in the future.

Several factors have severely limited the use of formal training, including:

- financial constraints for course development by broadcasters and unions;
- the specialization of some skills which makes it difficult to assemble resources for formal seminars or workshops; and
- the lack of a co-ordinating body to bring together the key players in the industry in a skills development focus.

Women And Skills Development

College or university training is not enough to gain entry at intermediate or senior levels. Real-life experience is critical for skills development. Vacancies can usually be filled from within or from other smaller stations. Union seniority often works against new entrants.

Consequently, people must start at the bottom, often performing routine manual labour considered difficult or undesirable for women. Those women who do attempt the conventional "earn-your-dues" route are frequently not given the same respect as their male colleagues, or are intimidated by the predominance of males in technical positions.

Women hence are streamlined into their traditional roles -- hairdressing, make-up, costume design, and production assistance. Areas such as camera, audio sound and lighting, and editing continue to be male preserves.

CRTC and NFB data indicate that women have represented more than 50 percent of post-secondary graduates in the film and broadcast area, and yet hold less than one-fifth of the jobs in technical leadership functions in the industry. In certain key areas, such as camera operation and sound recording, women occupy less than 10 percent of the jobs. In the maintenance field, women are virtually excluded, partially because few women are enrolled in college electronics technology programs.

Solving inequalities in access for women to certain key jobs in film and broadcasting is a difficult task and will take time to accomplish. But slow progress is being made. The CBC and National Film Board have established programs to enhance the roles of women. Women have established a strong minority presence in functions where men held almost all positions 10-15 years ago.

Expansion of existing apprenticeship programs and formal training programs, coupled with efforts to increase female participation, could give more women a chance to make contacts and find a first job. Greater promotion of these skills development programs, could attract more female graduates of post-secondary film and broadcasting programs who presently seek employment in other industries.

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OPPORTUNITIES TO ENHANCE SKILLS DEVELOPMENT

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Eight key training issues in the five service industries have been identified:

1. the extent of formal versus on-the-job training;
2. the role of industry associations;
3. the training implications of part-time workers;
4. the impact of technology on training requirements;
5. the importance of foundation technical skills;
6. women and careers in services;
7. the role of train-the-trainer programs; and
8. the importance of management skills development.

Each of these issues is discussed in turn below.

THE EXTENT OF FORMAL VERSUS ON-THE-JOB TRAINING

Each of the five service industries studied has varying approaches to the use of formal and on-the-job training. An examination of the approaches of the five industries to formal training indicates that the greater the ability to standardize curriculum and to take advantage of economies of scale, the greater the degree of formal training. Smaller, more fragmented industries have difficulty mobilizing the resources for formal training and rely heavily on on-the-job training.

In financial services, a great deal of formal training occurs. The banks alone spent an estimated $113 million on formal training in 1984-1985. The trust and insurance companies conduct extensive formal training as well. A high degree of standardization is possible because large numbers of people can be imparted with generic knowledge such as customer service, selling techniques, management of technology, often in a formal classroom setting. A great deal of informal, on-the-job training also occurs within the industry.

Within the hospital sector, formal training is important. For the professional areas, formal training is a requirement to practice. In the administrative and management areas, formal training occurs but its implementation is inconsistent across the spectrum of occupations. There is a potential for further standardization of training, given the size of the organizations and the tendency for some of the larger hospitals to merge to take advantage of economies of scale.

Ongoing, formal training within the manufacturing services installation and repair industries is significant. Apprenticeship training, typically lasting from three to four years, is available for workers after entry into the industry. Skills upgrading is provided in industry through training programs offered by equipment vendors or through employer-sponsored part-time courses at community colleges.

Manufacturers are beginning to recognize that enhanced formal training could prevent costly machine downtimes. There is increased recognition of the need for machine operators to become familiar with repair and maintenance as machines become more complex. Opportunities exist to expand the existing base of formal apprenticeship training to respond to these skill needs. Findings suggest that the manufacturers could play a larger role in developing skills related to installation, repair and maintenance, perhaps with the assistance of community colleges.

Little formal training occurs in the design industries. This is largely due to the fragmentation and small size of industry participants. The high degree of specialization in the field also presents a barrier to standardized advanced training programs beyond community college or university. Industry entrants develop the required technical skills at post-secondary institutions, but then must hone their skills on the job. Employees look to the education system to provide the necessary foundation skills.

In the broadcasting and film industry, there is little formal training, with the exception of equipment maintenance. In the film industry, producers tend to hire the skills, as opposed to investing in training. This is due largely to the project-by-project employment approach by film producers. The industry is also very much of a freelance industry, with formal or informal training not afforded a high priority. In broadcasting, as well, formal training is not a priority. The industry believes in the philosophy of learning on the job. Hands-on experience is considered a necessity in broadcasting. Broadcasters and unions agree on the utility of formal programs for skills upgrading but generally lack the resources to develop such programs individually.

THE ROLE OF INDUSTRY ASSOCIATIONS

The investigation of training issues in the five service sectors has indicated the important, yet sometimes underutilized, role of industry associations. In some cases, a more active use of industry association resources could yield important gains in the breadth and quality of training.

Government involvement with industry or professional associations in training-related issues is perhaps most developed in the health disciplines. As an example, nursing training policies and standards are developed and negotiated by no fewer than five professional associations and ministries. The health disciplines example suggests that government involvement with associations is greatest when the association is well developed and/or the issues involved are potentially very important to the public.

Despite the important training challenges facing hospitals in the areas of management skills and information systems development, hospital associations, unlike health discipline associations, have not played a key role in training.

In financial services, the banks, trust and insurance companies have long recognized the importance of training. These industries have the advantage of a large scale in addressing their training needs independently, often using industry supported training institutions, such as The Institute of Canadian Bankers, The Canadian Bankers Association, The Canadian Securities Institute, The Toronto Stock Exchange's Education Division, The Trust Companies Institute, The Trust Companies Association of Canada, The Insurance Institute of Canada, The Life Insurance Institute of Canada, and The Life Office Management Association.

Unlike the larger financial industries which have made a substantial commitment to training, the brokerage industry, with firms of a much smaller scale, has not demonstrated the same commitment.

In the area of repair and maintenance services to the manufacturing sector, there is a clear need for assistance in expanding and modernizing training mechanisms, particularly for electronics. Individual manufacturers have not, however, recognized the potential for a coordinated industry approach. For many manufacturers, the high degree of skills specialization required for some occupations related to repair and maintenance, such as electronic technicians, may preclude individual firms from developing standardized training. Other manufacturers may lack the economies of scale to justify development of their own training programs. Government or the colleges could play a greater role in this area, perhaps through regional industry associations, to develop cooperative manufacturer/community college training programs.

The design industries are highly fragmented. The most viable option for developing cooperative training initiatives in these industries could be the respective design industry associations: The Association of Registered Interior Designers of Ontario (ARIDO); the Association of Canadian Industrial Designers of Ontario (ACIDO); Toronto Ontario Designers (Fashion Design); and the Society of Graphic Designers of Canada. Presently only ARIDO has a well-developed training certification and skills upgrading program. Using it as a model, other associations in the design sector might be encouraged to develop their own training systems.

The broadcasting and film industry has many associations, with most divided along functional lines. Producers and directors each have their own associations, as do actors and camera operators. Technical personnel are split among three unions: NABET; IATSE; and ACFC. The only broad industry-wide association is the Academy of Canadian Cinema & Television, which has made only limited progress in the skills development area. This fragmentation of the industry, combined with the effect of skills specialization for some occupations, has seriously hampered the development of cooperative training programs. Industry participants agree that the pooling of needs and resources would facilitate the development of a very productive skills training system.

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TABLE 11

FULL-TIME AND PART-TIME EMPLOYEES
IN FINANCE, INSURANCE
AND REAL ESTATE, 1985

Male Part-Time As % of Total	Female Part-Time As % of Total
5.9%	14.3%

SOURCE: Statistics Canada

THE ISSUE OF PART-TIME

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Service industries tend to rely more on part-time workers than do manufacturing industries. In 1985, 25 percent of employees in the service sector were employed on a part-time basis while only 3 percent of manufacturing employees worked part-time. The restructuring of the Canadian economy to increase flexibility and respond more quickly to fluctuations in demand is likely to increase the use of part-time staff. This trend could reduce the extent of on-the-job training opportunities as employers may be less willing to invest in upgrading skills of part-time staff. This phenomenon has other implications. Because women tend to be part-time workers much more so than men (30 percent of women in service sectors are part-time compared to 10 percent of men), women would bear a disproportionate amount of the costs associated with fewer on-the-job training opportunities, contributing further to the inequality of their earnings versus men.

For two of the five service sectors -- financial services and hospitals -- part-time workers represent particularly important components of the workforce. But the training needs differ in each of these industries. In financial services, questions of how to deliver training (computer-assisted, self-learning) and when to train (day or evening) must be dealt with.

In the financial industry as a whole, the majority of part-time employees are women -- 14 percent as compared to 6 percent for males. In the banks alone, there were 21,978 part-time employees in 1986 on a full-time equivalent basis, up from 6,860 in 1975. This current part-time figure represents 14 percent of all bank employees.

In financial services, particularly in the banking and trust industries, pressures to extend hours of retail operations raise increased questions about the training of part-time workers. In addition, increased competitive pressures and a wide proliferation of financial products imply that such training become an imperative. However, it has been largely ignored to date.

Within public hospitals, the training of part-time workers is not yet a significant issue. Growth in the number of part-time workers has, nonetheless, been dramatic, especially in nursing.

Between 1979-80 and 1983-84, total full-time employment in hospitals grew by 6 percent while part-time staff grew by 41 percent. In nursing, the growth of part-time was dramatic, at 43 percent, and even more so in diagnostic services, at 55 percent. Conversely, full-time employment grew by 3 percent and 14 percent respectively. The demand for part-time workers exists as a result of two factors: hospitals must be open 24 hours a day; and there is a movement, particularly in nursing, from full-time to part-time work, due in part to conditions of job-related stress, family pressures, and more favourable economic conditions.

In hospitals, training of part-time workers is not yet a major requirement due to the fact that many part-time employees have moved from full-time to part-time work. Consequently, many have already been trained. In the future, as new technologies continue to effect skills needs, upgrading of part-time hospital employee skills may become a major challenge.

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TABLE 12

PUBLIC HOSPITALS FULL-TIME AND PART-TIME WORKERS, 1979-84

		Total Employees		Nursing		Diagnostic	
	Number of Hospitals	Full-Time	Part-Time	Full-Time	Part-Time	Full-Time	Part-Time
1983/84	223	98,100	39,700	40,300	21,700	21,800	6,800
1981/82	232	96,900	34,500	40,600	19,000	20,800	5,500
1979/80	230	92,900	28,100	39,200	15,200	19,100	4,400

SOURCE: Statistics Canada

TECHNOLOGY AND TRAINING

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The five industries studied have adapted technology in varying degrees. The financial services, and installation maintenance and repair sectors have been most affected by advances in electronics, and face difficulties in upgrading skills in response. In the other three sectors the challenges are less intense: hospitals are adapting more user-friendly off-the-shelf systems; design industries are only gradually investing in technology, and its practitioners are expected to adapt to it with less difficulty than in other industries; and broadcasters and film producers have faced few disruptions from technology.

Financial services have been undergoing technological change since the 1950s when it was one of the first sectors to adapt computers for information processing. In the 1980s, technological developments have accelerated markedly, with the electronic movement of information in the banking system.

Financial services institutions have had to stay on the leading edge of technology simply to remain competitive. The large scale of each of the competitors has made it economically feasible for them to make the large investments necessary to adapt the technology and for suppliers to continue developing new solutions for the financial sector.

More and more, technology is affecting the way clerical and customer service people carry out their work. Major retraining initiatives will need to be undertaken with the emerging of surplus skills in clerical, bookkeeping, and cashier functions, and shortages in skills relating to systems analysis, EDP operations, and programming. Skills development in technology has not kept up with the equipment itself, presenting financial institutions with a major challenge in training. This is in spite of the industry's long tradition of being a leader in skills development.

Installation, repair and maintenance services have not kept pace with the changing demands of technology. Service capabilities are often insufficient to meet the needs of the increasing complex, specialized electronic equipment being used by manufacturers. Installation, maintenance and repair services have historically relied on the apprenticeship system or on the development of general maintenance and repair skills within manufacturers' own operations. Substantial training to upgrade skills has not been a tradition in this sector, as workers were able to adapt to relatively minor changes in electro-mechanical machinery. In addition, the reliance on batch processing and inventory stockpiles meant that machines being taken out of production for days at a time for repair and maintenance was an acceptable occurrence. However, with the increasing reliance on more continuous processes and just-in-time production systems, equipment down-time must be kept to a minimum.

Repair and maintenance skill requirements extend beyond manufacturing to service industries which are also making increasing use of advanced technology equipment and systems. Financial services, public hospitals, design and broadcast and film production industries are all investing in advanced technology. For the most part, operation of advanced technology equipment has not been a problem since the equipment tends to be user-friendly and relatively simple to operate. However, with the possible exception of broadcast and film production, the service industries have limited repair and maintenance capability and therefore face similar repair and maintenance issues as those faced by manufacturing industries.

In public hospitals, information technology is being introduced to reduce paperwork and provide better service to patients. Hospitals have been able to rely on user-friendly off-the-shelf systems. Staff training to date has not presented a major challenge, requiring little more than in-house training and assistance from system vendors. However, skill shortages have been identified in word processing.

The key challenge facing hospitals will be at the management level where the proper use of improved information systems for decision making will be required. Management skills of medical practitioners, relied on for hospital management, will need to be developed to capture the full potential of technology.

In the design industries, computer-aided drafting and design is being introduced to eliminate repetitive work and to enhance the optimization process necessary for combining creative needs with technical constraints. Because design firms tend to be small, and individual practitioners are common, many have been unable to afford the required investment. By and large, skills upgrading to meet the needs of technology has not been an issue where it has been introduced. Creative and technical staff are typically younger, well educated, and adaptive to change. There tends to be less fear of technology and an appreciation that it represents only a tool in the design process.

The broadcast and film production industry has made use of advanced technology in parts of its operations for decades. Electronic cameras, recorders, editing and switching equipment have been in place and are evolving constantly. Most changes have been readily adapted to by operators. The critical importance of equipment maintenance and repair has been recognized by live television broadcasters and film producers with expensive crews. Consequently, it has ensured that its maintenance and repair technicians are highly trained and that skills are developed to stay abreast of technology.

THE IMPORTANCE OF FOUNDATION TECHNICAL SKILLS

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One of the key issues emerging in all five service industries, is the importance of foundation technical skills.

In financial services the expanding array of competitive products is necessitating a high degree of sophistication and a solid understanding of product features and market requirements. The ongoing adoption of computer technology continues to heighten the demand for programming and operation skills.

Health care is delivered by highly trained professionals who must have a solid grounding in their disciplines and keep up to date with rapid growth in knowledge and technology.

Installation, repair and maintenance services for manufacturers have always required a well developed foundation of technical skills, but with the introduction of electronics-based equipment the need to understand the technology has increased as such equipment is more sensitive and not amenable to ad hoc repair jobs.

In design industries, technical knowledge is as important as creative talents. The design profession must be able to realize design objectives within the technical constraints of the environment or medium in which he/she is working. Graphics designers must understand the requirements of printing processes. Interior designers must have knowledge of interior construction methods. Industrial designers require an understanding of visual, tactile, safety, and convenience criteria used in the products they design. Fashion designers are closely tied with garment manufacturing and need to have a working knowledge of production processes and textile characteristics.

Broadcasting and film production requires a diverse set of technical skills in the production of sound and picture images for film or videotape from set design to camera operation, in post-production where raw images are transformed to a final print or tape, and in the maintenance of sophisticated electronic equipment.

Generally speaking, employers look to the university and college system to provide new hires with solid foundations in the technical skills required for proficient work in their industry. Graduates are expected to have both learned the fundamentals from a theoretical perspective and been exposed to the practical realities through projects and co-operative type job experiences.

Employers understand the financial constraints of public institutions such as community colleges and do not expect students to be fully experienced with specific types of equipment or technology. To a certain extent, this can be gained on the job. Instead, they look for students who have the base level of understanding of the technical requirements, upon which to develop new skills on the job. Suggestions put forward by employers for improving technical training in educational institutions included: updating curricula and instructors; condensing programs into fewer, higher quality programs; and greater reliance on co-operative and work experience components, to strengthen basic skills prior to graduation.

In three of the industries studied, women were not participating in the full range of career opportunities. In each of the three -- financial services; installation, repair and maintenance; and broadcasting and film production -- a variety of forces were at play.

In financial services, women account for 60 percent of employment, concentrated heavily in the administrative support area. In banking for example, women represented 93 percent of the employment in administration support levels with salaries in 1986 of less than $22,000. Conversely they occupied two percent of senior management levels.

In the installation, repair and maintenance industry, relatively few women participate. The industry continues to be a male preserve, in spite of skills shortages that could be alleviated by encouraging participation of both sexes.

In broadcast and film production the earn-your-dues approach requires entry level people to perform some manual labour for which many women are not physically suited or inclined. Some employers have experimented with small-scale affirmative action programs to give more women the opportunity to develop technical skills. But the physical demands of moving equipment and the difficulty of infiltrating a male preserve have discouraged female employees and held such programs back. Where women have taken on the challenge of entering the industry, they are often not granted the respect or opportunities given to their male colleagues.

Side-stepping the physical tasks and entering broadcast and film at a higher level of skills is not seen to be a realistic for all but the elite few, as the tradition of the industry is that of working from the ground up. Additionally, the lack of many new job openings, especially in broadcast operations, makes it difficult for employers to depart from the current system of moving through the ranks. In the maintenance and repair side of broadcast operations, where hard physical labour is not an obstacle, few women graduate from the college system. As in manufacturing installation, maintenance and repair service industries, female high school graduates are often not attracted to this type of career.

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TRAINING THE TRAINERS

In two of the five service sectors studied -- financial services and broadcasting and film -- train-the-trainer programs have been extensively utilized. The development and implementation of these programs is a function of several factors -- the scale of the organization, the extent of formal training and the degree to which companies are technologically driven. Such programs are likely to be more common in organizations where large numbers must be trained, particularly when organizations are geographically dispersed. In public hospitals, manufacturing installation and repair services and in the design industries, there is currently less of an emphasis on training the trainers, although some examples do exist.

In financial services, train-the-trainer programs represent essential elements of human resource development, while in a few instances companies cited difficulties in gaining the commitment of resources for this purpose. In banking, insurance and trust companies particularly, there is a need to train trainers due to enormous firm size, extensive formal training requirements, wide utilization of computers and technology, and geographic dispersement. Currently, however, most of these companies rely on supervisory staff to conduct training, both on a formal and informal basis.

In broadcasting and film, train-the-trainer programs are also in place. The large size of the Canadian Broadcasting Corporation, with employment of 12,000, has prompted the development of a corporate-wide train-the-trainer program. At Global, train-the-trainer programs have been technology driven in the equipment maintenance and repair areas. Following installation of new equipment, vendors often offer programs for senior technicians, who then impart training to others within the Global organization.

In the design industries, train-the-trainer programs are not common. This is due to the fact that most of the training in this industry is provided informally and on-the-job. Most often, junior people learn-by-doing from senior level employees.

In public hospitals, such programs are virtually non-existent, although hospitals do have training departments with the resources to develop the programs and course materials.

Finally, in manufacturing installation, repair and maintenance services where formal training outside the apprenticeship is not a major factor, the incidence of training the trainers is low. Opportunities do exist for equipment vendors to offer training to employees, who could then diffuse the skills throughout the organizations. To date, however, limited use has been made of this option.

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THE NEED FOR MANAGEMENT SKILLS TRAINING

For a number of the service industries studied, there are good training mechanisms in place for developing required technical skills, yet there remain critical gaps in the area of management skills training.

In the public hospital system, doctors, nurses, and allied health care personnel are trained for specific tasks related to delivery of health care, but not for management. Yet it is from these groups that hospitals draw most of their management and supervisory personnel. The Canadian Hospital Association, Ontario Hospital Association, and individual hospitals provide varying types of management skills training opportunities, but their application appears to be very uneven across the public hospital system.

Many repair and maintenance, design, and independent film production businesses are small operations run by entrepreneurs who are trying to capitalize on their technical skills. In many of these operations, the proprietor has little if any managerial training. Assistance in basic management skills development could enhance the viability of these "professional" service shops and contribute to a higher rate of success.